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Vol 47, No. 1

March 2005

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[PUBLISHED BY THE NIGERIAN ECONOMIC SOCIETY]

## NATURAL RESOURCE CONTROL: A Market View

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### ABSTRACT

Government ownership of land resources generates under-pricing of these productive resources. Public ownership, therefore, is responsible for excessive exploitation of the common property. Given the positive relationship between the level of output and environmental degradation resulting from production externalities, it is certain that common ownership is more prone to result in greater damage to the environment than private ownership. Restoration of private ownership and control of land is, in economic terms, a better choice for efficient resource allocation and environmental protection. The petroleum producers will pay for all factor inputs used in their production processing and the government is likely to gain from the new ownership regime since it will raise additional tax revenue from rent.

JEL classification: L72, O13, P28, Q3-5

### 1. Introduction

THE natural resources of any country play a very crucial role in the production of any commodity. These resources can be lumped together and classified as *land* in economics; and their acquisition and use are constrained by their limited supply. Competition for the ownership of any resource has resulted in a series of ownership schemes that vary from the purely private to purely public, and various combinations of the two. Economists may argue about who should control a country's natural resources, however, no matter in whom the resource ownership and control rights are vested, the expected economic goal is the optimization of both the net private and social benefits from their use.

The agitation for resource control is related to the issue of the appropriation of the benefits accruing from such resources and the management of externalities arising from the use of those resources in production. In Nigeria, given the existing system of the ownership and control of natural resources, and the ongoing controversy about that control, a few points can be raised that are of importance

to economic analysts. First, since the resources have been managed under some ownership and control structure, there is a need to evaluate how such arrangements affect social welfare (development). Second, given the on-going dissatisfaction and agitation for change, it is necessary to make a counter-factual analysis between what is on the ground now and what the outcome of any new ownership-control scheme is likely to be. The aim is to answer an economic question: Will the intended regime of ownership and control arrangements leave the economy and its agents better-off? In an attempt to provide answers to this question, this paper employs theoretical tools to evaluate what type of resource ownership and control is likely to be more beneficial to the economy. Since the oil resource has been exploited under government control, some empirical information will be cited from this sector.

The paper has five sections in all. After the introduction, section 2 gives theoretical issues on resource ownership and control, while section 3 deals with benefits and costs to the economy of Nigeria's exploitation of oil. Section 4 attempts to answer the question: 'Can the ownership and control regime alter the benefit-cost outcomes?' and section five presents the conclusion.

## 2. Theoretical Issues in Resource Ownership and Control

Many activities take place behind the thin supply curves in economics. Behind the supply curve, costs are incurred. Before these costs are contracted, resource owners must, in a market setting, be willing to offer their productive resources to a producer at an agreed price. At the assemblage of the necessary factor inputs in a process of value transformation and creation, some production function is formed, still behind the supply curve. The dual analyses of production and its cost have dominated received economic theory of producer behaviour. This is sometimes done at the expense of understanding the operations of input markets. Yet economics is also concerned with how the prices of resources – land, labour and capital – are set in an economy, and how these prices are used in allocating those resources.

In a market economy, individuals own productive resources of which land is one. 'Land deals are transactions not in land but in-rights in and over land, rights which in the aggregate are known to English law as *property*. Ownership of property in land is the ownership of a bundle of rights' (Denman, 1964: 9). The term 'property' suggests in its usage the existence of more than one person – it takes two to create the right to property for no one can uphold a right against oneself. This means that ownership of property in land has inter-connections of rights in which relationships are specified in space and time. Another important characteristic of ownership of land is that it confers the ownership of a bundle of rights. A parcel of land consists of more than the topsoil which can be used for building. Land can be used for a multitude of purposes: recreation, agricultural,

for building construction, etc. Beneath the surface of the land there are underground water and various minerals. Landowners receive rent as a return on the use of the land for productive purposes over time. Rent as a return on land use stems from the classical consideration that land has a fixed supply with zero opportunity costs. This makes all its earnings an economic surplus over and above its alternative return, zero. The inelasticity of supply in a global sense has been the reason behind high tax rates on rental incomes, since landowners are the ones that would wholly bear the burden of such taxes. Nevertheless, apart from absolute considerations, the supply of land is elastic with respect to rent in its specific uses. The value of land for agricultural purposes or for residential buildings or indeed for any other usage can be increased if the potential land users are willing to bid away land from other users by offering higher rents. The elasticity of land supply depends primarily on the extent to which a property can be adapted to meet various uses. As long as the use of land can be considered for different purposes, its supply is elastic and the effect of an increase in demand will not result in as high a rent as it would if the aggregate demand for land change is relative to the aggregate supply of land.

Rent acts as an indicator of the relative scarcity of land resources and has serious implications for the use of the property. Individual ownership of land entails interest in the qualitative usage of the land. However, when such an interest is not protected, the government can legislate and enforce usage that will guarantee good environmental quality. This regulation can be exercised through high, and sometimes prohibitive, rates of taxes on specific uses that do not guarantee a high standard environment.

With private ownership of land, therefore, the rent is usually set in such a way that all land is efficiently allocated among different uses until the marginal physical products of land are equal in all lines of use. As long as the value created by land is higher in any one line of use than in others, land in that locality will be bid away from the less productive uses to the more profitable production lines by the offer of higher rents. This allocation adjustment holds even when issues that border on differential rents for parcels of land in seemingly the same location are taken into account, and when activities of land speculators are considered.

Invariably, under the private ownership arrangements, over-use or under-use of land is not a rational possibility. That is, no land user will be willing to pay more than the land can yield and no landowner will lease his property at a lower rent than the going market rate. The proprietary interests of the landowner ensure that an appropriate price is paid for the use of his property over time. This checks over-exploitation resulting from an excessive decline in the marginal physical product of the unit of land resource used, as land users will stop using the land when its marginal product equals zero. Given a positive rent no producer will use

land to the point where its marginal product is negative. Negative marginal returns on land are often experienced when land resources are made into commons. Here too lies the so-called 'tragedy of the commons'. Since the commons are open to all, the free and economically unrestricted access to its use brings ruination. These problems are observed in all commons where no restriction is made to control usage. As a way out of the tragedy Hardin (1968) suggested 'we might sell them off as private property. We might keep them as public property, but allocate the right to enter them'. Other suggestions by Hardin evolve around these two and include; introduction of rent, an auction fees system, standard of merit, lottery and queues.

The problems inherent in the commons are observed in property annexed by government legislation as public property. Production activities that take place on such property might be very difficult to control. Under-pricing of the property and over-exploitation of such land resources are possibilities. Thus, nationalization of land is likely to become a nominal affair because, as Denman (1964: 10) objected, 'property rights cannot be exercised by an indeterminate body of persons'.

Commons also have an impact on costs of production. Since such property is undervalued, and sometimes has a zero price, the output valuation might also be wrong for a production function:

$$Q = \beta + \alpha_K K + \alpha_L L + \alpha_R R + \mu \quad (1)$$

where:

$K, L, R$ , represent capital, labour and land, respectively;  $\alpha_i$  represents their respective marginal products; while  $\beta$  and  $\mu$  are the scale effect, and technical progress and efficiency effects, respectively.

The price of  $Q$  per unit is equal to the sum of the value of marginal products of all inputs used. That is,

$$P = V\alpha_K + V\alpha_L + V\alpha_R \quad (2)$$

where:

$V\alpha_i$  = value of marginal products of factor  $i$  ( $i = K, L, R$ ).

Since:

$$V\alpha_i = MC_i = r_i, \text{ then}$$

$$P = \sum r_i \quad (3)$$

where:

$MC_i$  = marginal cost of input  $i$

$r_i$  = returns on ( or price per unit of ) input  $i$

Assuming that the producer is not an influential firm in his output market, meaning that he is a price-taker, then he will adjust the combination of inputs in such a way that equation (3) will hold. However, in a situation where any of the inputs is under-priced the producer will continue to produce profitably even after the point that would have been the equilibrium level of output.

From figure 1, we deduce that it will pay the producer to produce  $Q_c$  instead of  $Q_p$ , (where  $Q_c$  = output level with common property in some factor and  $Q_p$  = output level in a complete input market). Common property or nationalization of resources is therefore a form of producer's subsidy. Besides, in a situation where environmental quality is a subjective and positive function of output level, then, reserve of common property with its implicit production subsidy, is subsidization of the environmental damages.

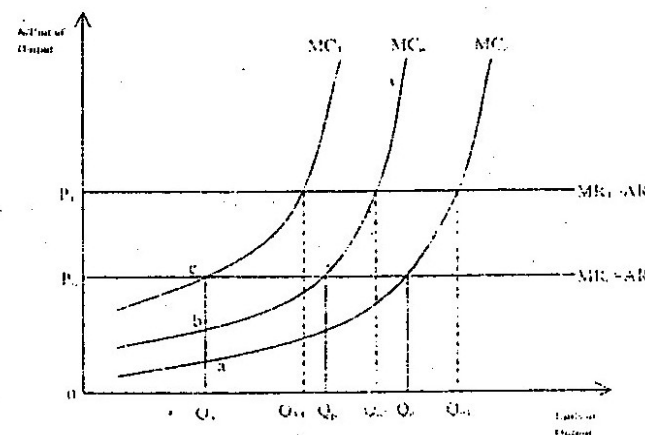


Fig. 1 Output/Production Tax, Land Pricing and Production

Even at output level  $Q_p$ , it is expected that environmental degradation will occur because the private sector pricing rule does not internalize external costs generated by production. This calls for government intervention through tax measures such that the producers will be forced to cut back their output level to a socially desirable level with a tolerable effect on the environment. In figure 1,

the socially acceptable level is  $Q_T$ . This level of output comes with less tax,  $bc$ , and less reduction in output  $Q_p Q_T$  under private sector operations than comparably higher tax  $ac$  and a greater cut in production  $Q_p Q_T$  under public ownership and under-pricing of land resources.

The critical issue is that if the government is involved in the production, as is the case in the Nigerian oil industry where the Nigerian National Petroleum Corporation (NNPC) is a direct producer, then tax is not likely to be an effective environmental policy because the government is not likely to enforce a punitive tax against itself. Another serious impairment to such a tax policy with an under-priced factor is the apparent high impact on production and the high rate of tax, which may be resisted by the producers who have enjoyed the status quo. Even if government were willing to enforce the tax and drastically reduce the level of output, what is likely to happen in the case of Nigeria?

The hydrocarbon mineral resources are concentrated in the Niger Delta, a region inhabited by several ethnic minority groups, where nationalization of land property is mostly enforced. The environmental impact of this massive exploitation of land and mineral resources is localized to the region of production. The majority of policy-makers however, come from non oil producing regions, which means a democratic decision will not likely favour the ethnic minorities in the oil producing areas. If a purely rational economic consideration is adopted perhaps a consociational arrangement will give a most promising solution politically. However, policy-makers are not likely to accept a cut in production or private-control of resources that will reduce the rate of environmental degradation. Any reduction in output level may jeopardize expected national revenue and reduce federal revenue allocation to the policy-makers' states of origin. The fact that the Nigerian government is also a direct producer through the NNPC, would suggest that any reduction in oil production will be resisted.

Another reason why a production cut might not receive government support is the time preference in the use of public resources. In a stable polity with positive expectations concerning peace, unity and continuity, the choice of a consumption time path may balance between present and future consumption preference sets. With negative expectations about these political atmosphere indicators, policy-makers reveal a preference for current use of resources. Given the uneasy peace of the country and the insincerity and sophistry of national office-holders in attending to the issue of the national question, it is obvious that their choice of a consumption time path highlights a preference for present resource depletion. Issues of sustainable development are not likely to be addressed with such a choice.

The equilibrium level of depletion is affected by the resource ownership regime. The neoclassical optimal extraction level for depletable resources is

derived using three major sets of variables, namely, revenue or benefit accruing from extraction  $B(Pq(t), S(t))$ , costs of extraction  $C(q(t), S(t))$ , and a reserve adjustment variables as a constraint. The Hotelling model for optimal exploitation path for  $q(t)$  is that of maximization:

$$\int_0^T B(q(t), S(t)) - C(q(t), S(t)) e^{-\rho t} dt \quad (4)$$

subject to:

$$\begin{aligned} S(t) &= S_0 - \int_0^t q(\tau) d\tau \\ S(t) &\geq 0; q(t) \geq 0; S(0) = S_0 \end{aligned} \quad (5)$$

If  $\lambda(t)$  denotes the co-state variable for resource stock, the current value Hamiltonian function for the problem becomes

$$H(q(t), \lambda(t)) = B(q(t), S(t)) - C(q(t), S(t)) - \lambda(t)q(t) \quad (6)$$

The co-state variable,  $\lambda(t)$ , has the economic interpretation of the current value of the shadow price of the resource stock; that is, the resource *in situ* value or its user cost at time  $t$  (Krautkraemer, 1997).

There are three-point requirements as the first order condition. These are derived by taking the first differentials of the endogenous variables in the Hamiltonian equation (6) above. These conditions are:

- Static efficient condition* – that at every point in time the marginal gains from the resource extraction must equal the marginal cost of extraction, including the user cost of depleting the resource stock,  $\lambda$ . This is derived as  $\partial H / \partial q = 0$ .
- Dynamic efficiency condition* – that the rate of returns to holding the resource reserve, that is the sum of the capital gain and marginal net benefit generated by resource reserve (stock), should be equal to the rate of discount. This condition is derived by differentiating  $H$  with respect to  $S(t)$  and solving for  $\lambda(t)$ .
- Transversality condition* – that the present value of the resource stock, that is the *in situ* value, times the resource stock, must be equal to zero at the terminal time. This means that physical availability of the resource does not mean economic reserve, or that economic exhaustion does not mean physical exhaustion.

These conditions involve the evaluation of costs either directly or indirectly. Under-pricing of any factor will lead to a wrong conclusion that there are benefits.



The classical model of extraction has been criticized for failure to incorporate environmental amenities into the cost and benefit sides of the optimization problem (Krautkraemer, 1997). To resolve this problem, Yohe and MacAvoy (1987) integrated a tax incentive that would induce producers of goods that affect environmental quality to reduce their output or bear the costs of cleansing the environment, or pay the tax for environmental cleansing on any output higher than an environmentally efficient level.

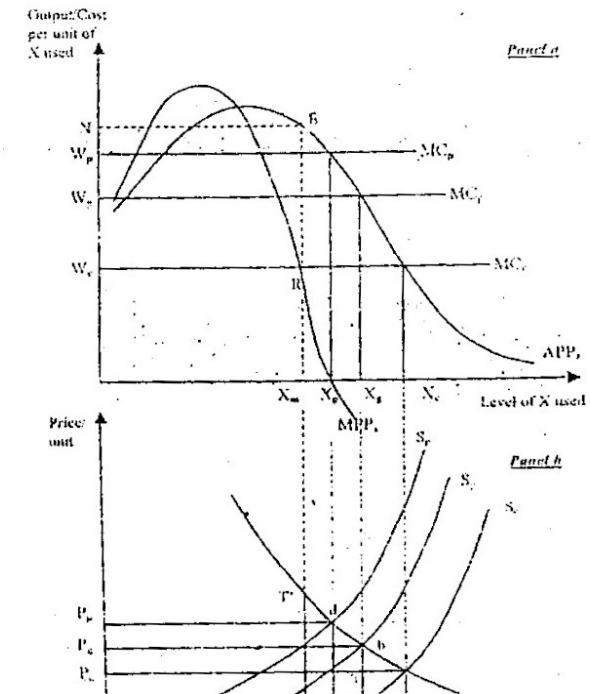
## 2.2 Property rights and economic theory

'Property rights are as fundamental to economics as scarcity and rationality. Unless some human agency has the right to control the use of whatever resource is in question nobody can set prices, and there will be no incentive for anyone to calculate costs of production' (Ryan, 1998: 1029). Economic theory as a body of knowledge is built on some fundamental assumptions concerning the socio-economic milieu that is the human society, on which the theory is built. Rationality of economic agents confers the existence of a morally sound and free society in which rights are guaranteed. One such right is the property right. Economists actually take for granted the fact that everything that is scarce in economic sense has an owner who exercises the power of control on such goods.

In a decentralized coordination of a productive specialization system, effective working can only be guaranteed if people have secure, inalienable private property rights in productive resources and products tradeable at mutually agreed prices. This arrangement for ownership and control of resources minimizes the transaction costs. These gains are reversed under the common property rights which leads to a sub-optimal objective set.

Aristotle's observation that common property is not property 'belonging to us all' but that 'belonging to no one' aptly summarizes the disadvantages of the sub-optimal objective. Under common property that allows open, free entry with every user sharing equally and obtaining average product returns, the use of such property will reach an excessive and sub-optimal point. Additional uses will continue with an increased realized total value that is less than the cost added, that is, the social product is not maximized. As this occurs, the marginal yield will be less than the average to every user. The effect of this is that the exploitation of common property will continue until the point at which the average yield is equal to marginal cost, with the result that the marginal product value will be less than the marginal cost (Frank, 1997 and Alchian, 1998). This unhealthy competition results in unsustainable exploitation of the common land, an economic pitfall of common ownership. The existence of a common directly means the non-pricing (also applicable to incomplete pricing or under-pricing) of the productive input that is regarded as the common. Such under-pricing is an incentive to sub-optimal allocation of that resource and is usually counter-productive and unsustainable.

The effect of common property and the associated under-pricing of resource are demonstrated in figure 2. For ease of the exposition, let us assume that the producer faces a perfect single factor market and that this is the only factor necessary. For his combination with the common to produce  $X$ , this producer



faced a horizontal marginal cost,  $W=MC$ . With the average product,  $AP$ , as marginal product,  $MP$ , the producer will exploit the common until  $AP = MC$  at that is at the output level  $X_c$ , which is sub-optimal given that the marginal product of the common is less than zero. The incentive for incursion into the common and to expand output beyond  $X_m$  given the marginal cost of  $MC_c$  is the existen

of surplus,  $WREN$  in panel *a*, which is completely depleted when  $MC_c = AP$  and output level is  $X_c$ . To get to  $X_m$  and preserve the environment, land should be made private property and tax introduced as indicated by  $PT$  in panel *b* of fig. 2. The social costs can, however, be reduced if the government introduces some fixed fee or tax,  $ab$ , per unit of output on the commons. The marginal cost will shift upon the  $W_s$  reducing the level of production  $X_s$ , which is still sub-optimal. This is because the government does not have enough market information to set appropriate rules for the use of the common. This may also be due to the moral hazard problem. The government agents will not benefit from higher rent for the common and therefore they set the rent below the market equilibrium.

This is the comparable case of gas flaring before the oil companies introduced better technology for oil extraction, where the government tax per unit of gas burnt was lower than the market cost per unit of output of oil. In essence, it was cheaper for the oil companies to flare the gas than to process it. If private ownership and free market operations are adopted as options it will be optimally profitable to produce at the point where the marginal product of all factors used is equal to zero and where marginal cost equals marginal revenue of the output.

Evaluation of costs in a classical model usually assumes resource ownership and control under a private arrangement through the market institution. Existence of government has also assumed to include the role of creating incentives to regulate economic behaviour in the market place. The interference of government in the provision of direct economic activities is fraught with agency problems that generate inefficient outcomes. Government ownership and control of any factor of production is usually frustrated because of under-valuation, under-pricing and misallocation of such resources.

### 2.3 Cost theory and resource control

One set of dualities that exists in economic theory is that of the production and cost functions. Whenever reference is made about one of the functions there is inference to the other. For production to take place, there has to be hiring of inputs that will result in an accumulation of costs by the producer. By income distribution principles implicit in cost theory, it is observed that costs represent income earned by owners of the factors of production. Fundamentally, one of the axioms on which the cost theory is founded is that scarce resources are owned by rational individuals or groups who supply them at some agreed prices for use in production. Property rights do not start from the ownership of produced goods, they begin from the right to ownership of the primary means of production – land, labour and capital. It is the recognition and acceptance of this right that guarantees orderly negotiation of prices for factor inputs, and freedom to offer and hire inputs at some prices.

The relations of production and value distribution that result therefrom develop naturally under a market arrangement. There is a market for every resource, and, as a result, there is a market for every commodity produced – what is commonly referred to as 'Say's Law'. It is when factor inputs are earning the due returns on their contributions to production that supply, indeed, creates its own demand. By these relations, activities of any agents that would make the other worse-off can be resolved using bargaining and the pricing mechanism, since these agents cannot do without each other.

The exclusion of any factor market by outlawing the right to private ownership rights can only complicate market imperfection since that will create an incomplete market problem. Under this condition, all markets cannot clear because there is a factor that does not earn returns. Thus, the supply multiplier cannot be complete, and this results in the unemployment of resources that would have been employed if all resources had earned their due returns. The effect of an incomplete factor market is not revealed contemporaneously because of the nature of input markets whose transaction cycle is inter-temporaneous. Such an obstruction of an input market will cause inappropriate pricing of the input, which will in turn introduce distortion to the profit level of the firms that employ the obstructed input. In Nigeria where the Petroleum Act of 1969, Land Use Decree of 1978 and other petroleum laws give the mineral exploiting companies free and unrestrained access to the use of land, it is natural to expect that land is grossly under-priced in the sector. It is not surprising that the Constitutional Rights Project (1999) drew attention to the fact that crude petroleum extraction industries in Nigeria have the lowest average cost of \$2.00 per barrel as against the world's average of \$8.00 per barrel. This is explained by the under-pricing of some factor inputs, especially land and its mineral resources.

### 2.4 Issues in bargaining and resource control

The process of resource allocation and acquisition of the right to control resources is not entirely an economic issue. Socio-political activities inter-play to bring about the realized resource allocation set. Even in a market setting, allocation of resources is influenced by factors such as social norms, political influence, ethnic affiliations, religious beliefs and other human behaviour and activities outside the realm of economics. The ownership and control of natural resources such as forest, mineral and water resources are determined through economic rules in conjunction with other social considerations. Given an initial equilibrium in resource ownership and control, and in the presence of government involvement in the allocation and control process, it is only appropriate to consider the political strategy used in such a situation to bring about a change in resource ownership outcomes. Bargaining is the tool used the resolution of conflicts between political

interest groups. It is more commonly used among nation-states in international relations to resolve disputes. It is also frequently used within a country to reach a consensus in the law-making process, and in the resolution of inter-governmental conflicts.

'Bargaining', according to Goldstein (1996: 60) 'may be defined as tacit or direct communication in an attempt to reach an agreement on an exchange of value – that is, of tangible or intangible items that one or both parties value'. Accordingly, a bargaining process has two or more participants and sometimes has a mediator whose participation is normally neutral with respect to its outcome. The explicit communication in bargaining is referred to as negotiation. Negotiations can be direct or through an intermediary. The tacit communication in bargaining is more intriguing because it is expressed in the signaling actions of the parties involved in a conflict to communicate messages (Rourke, 1997).

Generally, all bargaining involves shifts in position that will result in finding a common ground acceptable to all parties. Given a bargaining space, which is defined by the distance between the position held by the disputing parties concerning their preferred outcomes on an issue, the essence of negotiation is to minimize that distance and to eventually evolve an agreement. Minimization of bargaining space in negotiation entails making some concessions but such compromises depend on the influence of the opposing parties and the expected gains by the party that is giving the concession.

In the process of bargaining several strategies may be adopted to gain leverage toward the preferred outcome. The leverage may operate on any of three dimensions of power, namely, *promise* of positive sanctions (rewards) if the other actor gives one what one wants; *threat* of negative sanctions (damage to valued items) if not; or an *appeal* to the other's feeling of love, friendship, sympathy or self-respect (Goldstein, 1996). The realist perspective has added violence as another leverage, although it has been argued that agreements reached through violence are not likely to last.

One common strategy in bargaining is to start with extreme demands and then gradually modify them and end up close to one's true (but concealed) position. Another is to 'drive a hard bargain' by sticking closely to one's original position in the belief that the other participant will eventually accept it. Fractionization, i.e., splitting a complex issue (conflict) into a number of small components so that progress may be sought on solvable pieces, is also a strategy in bargaining. This is in sharp contrast with linkage in which diverse issues are lumped together so that compromise on one can be traded off against another in a grand deal.

The parties in conflict enter into bargaining with some understanding that it is a game of strategy. Being a game, therefore, the anticipated outcome and the effect of that outcome on the welfare level, influence the strategic position taken

in the negotiation (Holsti, 1995). It may be a zero-sum or a non zero-sum game. The zero-sum games are those that take place along the Paretian equilibrium frontier. Here the gains of a party automatically represent losses to the other party, netting the sum of the outcome to zero. Non zero-sum games are those whose outcome can represent gains or losses to all parties at the same time; the gain to one party does not affect the other's outcome in the game. An example of the non zero-sum game is the prisoner's dilemma game. Resource control bargaining is a zero-sum game since an increase in the right to control more resources gained by one unit in the society entails divestiture of such a right from other units that had that right or that wanted such a right. Issues related to fiscal federalism, which includes the equitable allocation of funds among spatial sectors, among others, involves serious bargaining processes. Matters concerning natural resource control in a federation, and even in a market economy, are highly influenced by bargaining.

### 3. The Benefits and Costs of Oil Exploitation in Nigeria

The benefits of oil exploitation in the country have been evaluated using various measures including government revenue, export/foreign exchange earnings and development financing. These aspects have received serious attention in the Nigerian economic literature (Iwayemi, 1990; 1995; 2001 and Pinto, 1987.) As Akpan (1999) observed, the fiscal operations of Nigeria at all tiers of government depended up to 90 per cent on oil revenue from 1980 to 1997. In the direction of investment and development, arguments are favourably disposed towards assessing government expenditure on infrastructural facilities, namely roads, airports, harbours, telecommunication expansion, educational development especially the growth of tertiary education, etc. Government investment in core industrial projects has been financed by oil revenue, although most of these projects have turned out to be white elephants.

At the international level, Nigeria has committed a great amount of foreign exchange to the course of African political development in peacekeeping operations in Africa since the dark days of apartheid in Southern African countries. In the 1990s, the Liberian and later Sierra Leonean civil wars cost Nigeria over \$12 billion. In the area of international relations, Nigeria has spent relatively more than any other member-country in the maintenance of the ECOWAS and OAU secretariats. All these represent the contribution of oil wealth to Nigeria's economic development. In the remaining part of this section, an attempt is made to bring into focus the agency costs and environmental effects of direct government control of petroleum resources. Social costs of this regime of resource ownership and control are also highlighted.



There are many problems associated with direct government control of petroleum resources and its rent-earning activities. Some of the issues can be raised as social costs associated with the flow of oil revenue, namely, costs of expansion in government expenditure and size, accountability problems, and social crises.

### 3.1 Cost of the rapid expansion in government revenue and expenditure

Direct government control of petroleum resources has led to the rapid growth in government revenue and expenditure, leading to an excessive increase in the size of government. The government had been an active player in all major economic activities in the country before the 1986 deregulation policy of the Structural Adjustment Programme (SAP). This over expansion of government's role into economic enterprises has had some damaging effects on the economy.

- i. Given ease of collecting rent from the oil concessions as a source of revenue, government abandoned the use of taxation as a means of regulating economic activities and adopted the use of government expenditure. The neglect of taxation regulatory policies led the economy into a government-controlled regime prior to SAP with the higher costs of government administration, and sub-optimal returns on government investments. Ultimately, the private sector could not be controlled using tax incentives. With the reversal of the government role under SAP, the government has had serious problems in selecting the appropriate combinations of tax incentives to stimulate good and discourage negative economic behaviour. Besides, since such policies were not enforced during the time of the oil revenue boom, taxation has not been regarded by Nigerian private businesses as their civic duty to state. Perhaps the worst effect of the neglect of taxation control as a tool of economic management under direct government control of petroleum resources, has been the large-scale imperfections that existed (some are still existing) in both factor and output markets in Nigeria. These market failures could have been corrected using tax incentives.
- ii. The grandiose scale of government activity has also entailed a high rate of moral hazard and high agency costs. With the rapid expansion in government activities, government employees increased and government control of workers' personal and contradictory goals became difficult. This resulted in massive corruption. The government would have been able to stem the rate of increase in moral hazard if it had concentrated on the performance of its traditional roles and had not engaged in direct economic production.

- iii. The direct control of petroleum resources by the federal government has led to a high level of fiscal dependence in the Nigerian fiscal system. The federal government and the lower tiers of government do not have any incentive to source for revenue from other sources in view of the rental revenue earnings from petroleum resources.
- iv. The direct control of petroleum resources by the government also affects the control of foreign exchange. About 90 per cent of the foreign exchange requirements in the economy are supplied by the government from its crude petroleum export earnings. This has implications for exchange rate determination even under deregulation. Since the government controls the greater percentage of foreign exchange, it can still determine the exchange rate by determining the amount of foreign exchange to supply to the market.

### 3.2 Accountability problems

**3.2.1 The use of the oil resource as common property and fiscal indiscipline**  
Rental supply of revenue to the federal government due to its control of petroleum resources is a major reason for the lack of fiscal discipline and fiscal recklessness in Nigeria. At the lower tiers of government, the paternalistic supply of their fiscal revenue needs by the federal government makes them unaccountable to their constituencies. Generally, government revenue in Nigeria is exogenous or manna to all tiers of government. This makes for the sophistic argument that governments do not have to be accountable to their citizens because the revenue was not collected (at least directly) from the citizens. Thus, the lack of accountability on the part of government is the vicious outcome of government control of productive resources.

### 3.2.2 Poor records in the oil sector

Given government direct ownership and control of oil resources, agency activities have grown with vehemence in the oil sector. In the last Nigerian Economic Society conference, a director of planning in the presidency asserted that as at the time (2000), the National Planning Commission had never known the capital budget of the NNPC. Besides, there is still large-scale illegal oil bunkering in Nigeria. All these are proof of the high level of moral hazard due to the government's direct engagement in pure economic activities and ownership of economic resources.

### 3.3 Social crises

Some social problems have developed in the Niger Delta and other oil producing areas in Nigeria, which can be associated with the economic relations that have



evolved from the current resource ownership and control regime. The problems itemized here are, to a large extent, outcomes of some of those discussed above, and are typical results of the ownership of common property.

### 3.3.1 Displacement of traditional occupations

The dispossession of oil producing communities of their land and waters has created inherently endemic unemployment among the members of those communities previously engaged in traditional occupations. This has entrenched poverty and dualized the economic classes in oil producing areas along the lines of a modernized mineral producing, high-income economy with good economic infrastructures and social amenities and a contrasting subsistent income traditional sector with a high level of unemployment and a deteriorating environment.

### 3.3.2 High rate of environmental degradation

Unlike the oil spills in arid land where the problem is localized to points of impact; in the Niger Delta regions; because of the links created by water channels, heavy rains and occasional natural floods, oil spills and gas flaring have effects that are easily spread throughout the entire region through the relief and climatic factors as conveyance vehicles. This natural problem has been worsened by direct government participation in the exploitation, which, as Akpan (2000) pointed out, makes the government behave like a private profit-maximizing agent not interested in the minimization of its production externalities. Government's direct control of oil resources and participation in the production have reduced the government's role as an unbiased arbiter in the maintenance of environmental quality. Evidence of this can be seen in table 1 where, during the enactment of the Niger Delta Development Commission Act, the government (as would have been the case with private profit-maximizing producers dealing with externalities) required the oil producing communities to contribute to the funding for the removal of the externalities of oil exploitation in the area. Apart from exploiting rent-free land, oil companies in Nigeria have adopted obsolete technology that causes serious environmental problems. The Constitutional Rights Project (1999) reported that an oil company's average cost per barrel of oil in the world is eight dollars whereas Nigeria has the lowest average cost of two dollars per barrel. This is as a result of the incomplete costs of production introduced partly by government's nationalization and under-pricing of land; and partly by (and as a necessary consequence of common land ownership) lack of government interest in the economically optimal use of such land, for government is also a direct user and cannot legislate against itself.

Table 1. Sketch of Some Reported Social Discontents and Government Activities in the Niger Delta Region

Source	Activity of Discontent in Niger Delta Region	Government Activity in the Region
<i>ThisDay</i> Newspaper October 24, 1998	Nenibe community occupied and shut down flow stations leading to the loss of 300,000 barrels of oil in the area. In the Western Division, Shell's production loss at 250,000 b/d. Altogether 18 flow stations feeding Shell's Forcados and Bonny export terminals were shut down.	
<i>Post Express</i> January 3, 1999	As a result of the expiration on December 30, 1998 of their (the Ijaw) ultimatum to oil companies to quit, death toll rose to 20 following a clash between militant youths and security agents.	Following the expiration of the ultimatum on Dec 30, 1998, two warships, army tanks and personnel were moved into Yenogoa the capital of Bayelsa State to keep peace.
<i>The Guardian</i> January 4, 1999	Ijaw youths have been protesting against the relocation of Local Government headquarters to Ogidigben an Itsekiri village from Ogbe-Ijoh. Properties (houses) were destroyed in 17 Itsekiri and 4 Ijaw villages.	Gen. Abacha on 17 May 1997 set up admission of inquiry headed by Justice Alhasan Idoko, Chief Judge of Benue State. The Commission recommended creation of 3 local governments for the Ijaw, the Urhobo and the Itsekiri - the three ethnic groups in Warri as a way of ending the crises but was not done.
<i>Nigerian Tribune</i> December 6, 1999	Armed search in Warri by Naval/Army men - 50 youths arrested, those who resisted arrest were killed.	This search was a result of uncovered plot by Ijaw youths under Federated Niger-Delta Ijaw communities (FNDIC) to attack the Naval Base following the expiration of their 7-days ultimatum to the Federal government for the withdrawal of soldiers from Odi. In all, ten persons were killed including a pregnant woman.
<i>The Guardian</i> November 22, 1999	The president Olusegun Obasanjo, had threatened to declare a state of emergency in the troubled spots of Bayelsa. Following the increasing presence of soldiers, there was conflict and a shoot-out between the youths and the soldiers in Odi. Shooting lasted for two days 20-21 Nov., 1999. The trouble began in Odi on Nov. 4 when 7 policemen were murdered in cold blood. A few days later another 5 policemen were killed bringing the number to 12. Motorists were attacked. Consequently, President Obasanjo on Nov. 10 gave a 14-day ultimatum to the Governor to	<ol style="list-style-type: none"> <li>1. President's threat of state of emergency.</li> <li>2. Soldiers laid siege of Odi town since Nov 20, 1999.</li> <li>3. 50 Military trucks and 2000 of troops were moved to Bayelsa and most stationed in Odi.</li> <li>4. The federal government (President Olusegun Obasanjo) order the soldiers into Odi and gave a Shoot-on-sight order.</li> <li>5. The senate president, Dr. Chuba Okadigbo visited the scene Nov. 30 and found out that the destruction was enormous. Perhaps moved by the situation the senate had a marathon session in which they passed the Niger Delta Development Commission (NDDC) Bill.</li> </ol>

Source	Activity of Discontent in Niger Delta Region	Government Activity in the Region
	produce the culprits and the bodies of victims or risk imposition of a state of emergency. The killing of the twelve (12) policemen was as a result of police killing of 50 Ijaw youths in Yenogoa few days earlier. Soldiers were deployed, houses were burnt, defaced, broken into and looted. Many were killed. The town was completely deserted except the soldiers who took occupation of it.	<p>6. Deputy speaker Chibudom Nwuche led the House of Representative Committee visit to Odi on Dec. 5. The conclusion was very weighty. Survivors had never returned to Odi yet. Senate passed the NDDC bill.</p> <p>7. A radical environmental organization - Earth First staged a protest at the Nigeria's Mission in London to alert the international community of the wrong use of military by Obasanjo - <i>Tell</i>, Dec 13, 1999.</p>
<i>The Guardian</i> December 6, 1999		<p><b>Source of Funds to NDDC</b></p> <p>From the Federal Government, the equivalent of 15 per cent of total monthly statutory allocation due to member states of the commission for the federation account.</p> <p>About 50% or half of the not less than 13% or any formally approved portion of the revenue accruing to the Federal Account under subsection (2) of section 162 of the constitution of the Federal republic of Nigeria 1999 deductible at source.</p> <p>30% of the total annual budget of any oil and gas producing company operating on-shore or off-shore in the Niger-Delta area, including gas processing companies such as the Nigerian Liquefied Natural Gas (NLNG) company.</p> <p>About 50% of monies due to the member states of the commission from ecological funds, and such monies as may from time be granted or lent to or deposited with the commission by the federal or state governments or any other body or institution whether local or foreign.</p>
<i>The Guardian</i> January 17, 2000	Niger Delta leaders and front-line politicians met in Port Harcourt during the weekend calling on the Federal Government to review undemocratic laws that affect resource control and true practice of federalism. The laws include Petroleum Act of 1969, Land use Decree 1978, National Inland Waterways Authority Decree No. 13 of 1997, among others.	
<i>National Concord</i> April 21, 2000	Shell Petroleum Development Company dumped 40 trucks of materials suspected to be toxic	The Federal Government set up a committee to investigate the toxicity of the materials. But a

Source	Activity of Discontent in Niger Delta Region	Government Activity in the Region
	waste in a dry oil well in Ozoro in Isoko North LGA in Delta State.	member of the panel, Hon. Odhiegbo Abikelegba, alleged that Shell attempted to "bribe" him and another member of the panel with "N10,000 for each of the 40 trucks of substance deposited in the oil well, in addition to paying them N5 million each". The report of the panel had been submitted to Minister of State for Environment. Mr. Ime Okupido, but Senator Okpozo representing the area rejected on behalf of his people accusing Shell of influencing the falsification of the report.
<i>Daily Times</i> May 15, 2000	Chevron facility in Mallard (Bay 74 Rig) in Delta State was attacked by Ijaw youths forcing the company to shut down the facility.	Abia State Commissioner for Petroleum Resources asserted the NNPC officials colluded with members of Independent Petroleum Marketers Association to vandalise petroleum pipelines. He pointed out that inside information and knowledge is required to open pipeline valves.
<i>Vanguard</i> July 4, 2000	In Delta State, some people were proposing that the revenue accruing to the State from the 13% derivation principle be shared only to oil producing communities. Objecting to the proposal, a member of the State Assembly, Barrister Ejiafe Odetula, asked the Governor to disregard such calls as it will lead to breakdown of law and order.	
	Niger Delta Youth Movement (NDYM) threatens secession from the federation if the Federal Government fails to set in motion immediately the operation of the Niger Delta Development Commission (NDDC). This was due to the delay in signing of the Bill by the President after it was passed by the National Assembly.	
<i>The Punch</i> July 4, 2000	Youths in Ikot Abasi, Akwa Ibom State under the aegis of Niger Delta Youth Movement (NDYM) planned to embark on mass protest rally on Wednesday July 5, 2000, against the Federal Government stand on off-shore/on-shore oil dichotomy.	
<i>The Punch</i> July 10, 2000		A Port Harcourt High Court ordered the Petroleum Development Company to pay N5 billion to Ejana Community in Obudu/Eleme LGA of Rivers State. Justice Pen

Source	Activity of Discontent in Niger Delta Region	Government Activity in the Region
		Agumagu made the Award specifying that N1 billion represents cumulative damage while N3 billion represents the estimated current losses in spillage due leakage of pipeline the polluted Ejama lands, streams, ponds and environment.
<i>The Guardian</i> September 20, 2000	There has been pipeline vandalism in Ibad in Eti-Osa LGA, Lagos. Marine Police have been ordered to carry out investigation. There has been large-scale spillage in the area.	
<i>Vanguard</i> October 26, 2000	Youth in Calabar, Cross River State vandalize NNPC pipeline to siphon products and sell in the black-market.	
<i>The Punch</i> April 2, 2001		OMPADEC (Oil Mineral Producing Area Development Commission) abandoned over 700 projects according to Chief Onyema Ugochukwu, Chairman - NDDC. The NDDC is re-appraising them to know their viability.
<i>The Guardian</i> April 10, 2001		Federal Government had filed a suit in the Supreme Court against all the 36 states on resource control. The first appearance for the case was on Monday April 9, 2001.

Source: Author's compilation.

Some of the known cases of environmental problems have been reported in Nigeria. The case of oil spillage, which has been increasing with the growth in the volume of oil output, was covered by Attah (2003: 199). On the average, recovered spillage has only been 15.89 per cent of the total spillage since 1976.

### 3.3.3 Social tension and activism

With the growth in unemployment, environmental degradation and high development demands in the Niger Delta Region, there has been an increase in social tension. Apart from Lagos, it is doubtful if there is any other region in Nigeria that has had so many public protests and demonstrations against institutions as there has been in the Niger Delta since the beginning of the 1990s. There is no doubt that social activism against the excessively unequal and inequitable economic relations that exist in the Niger Delta has been hijacked by political motives but the foundation of the crises was caused mainly by economic problems. Some of the cases of social tension demonstrations are presented in

table 1.

### 3.3.4 The high level of corruption

The high level of corruption among government officials in Nigeria can also be linked to the high prevalence of agency activities that are associated with the large proportion of the resources controlled by government. A large government measured by the level of participation of government in socio-economic activities especially those outside the traditional government functions of maintenance of law and order, provision of internal and external security, and provision of infrastructures, increases the size of personnel and the amount of financial and material resources they use on behalf of the government. Altogether, large governments have more problems associated with information distortion. The large size also makes it difficult to control agent behaviour, which compromise their contributions towards the attainment of government goals. All these generate higher agency costs that manifest in a number of corrupt practices such as the diversion of government property (including official time, office – official capacity, funds and materials) to private use. A high level of control of natural resources by the state is thus susceptible to a high level of corruption in the public sector. The prevalence of corruption is a source of social poverty since the resources that could have been used for the increase in social welfare may be hoarded away by corrupt government officials for personal use.

## 4. Change in the Resource Ownership Regime and Social Gains

Optimal gains can be derived from the exploitation of natural resources if the state maintains the role of a law making and enforcing agent, and allows the private economic agents to engage in production and distribution. As shown in figures 1 and 2, state-ownership of productive resources leads to under-pricing and excessive use of such resources. This results in a serious externality problem. It also culminates in a large size government with a resulting inefficient control of government agents' behaviour.

Most of these problems can be resolved through the rearrangement of land ownership and control in such a way that the land is transferred back to the private owners. By so doing the government will remain a fair regulator of the use of land in terms of ensuring that environmental quality is safeguarded. This can be done with fiscal incentives and will be effective because the owners of the land are members of the communities where the production is taking place and they will also be interested in the quality of their environment. Moreover, there is growing awareness of the environmental effect of oil production among oil producing communities. There are community-based organizations that can assist the government in a genuine effort to minimize environmental problems under private land ownership regime.

Restoration of land ownership and control rights to individuals will make all tiers of governments stop acting as rent earners and work for their tax revenue. Governments will therefore have greater incentives to check and regulate economic activities so that higher tax revenues may be collected. This is likely to make the federal and state governments more interested in the investigation and cessation of illegal oil production and bunkering activities. Shift in land and resource ownership is also a way of giving incentives to all tiers of government to explore and exploit their constitutional sources of revenue, which will minimize dependence on oil revenue.

In terms of revenue generation, the government would derive more revenue from oil and other minerals than at present. This would be as a result of the more efficient use of resources that would be generated by the restoration of land ownership rights to individuals. The government would also tax the rental earnings from land as well as the profits from petroleum. Since the supervisory and inspectorate agents of government would concentrate on issues of control, the amount the government derives in the current ownership regime would increase by the returns from rent tax and from the minimization of corruption in the sector. Ultimately producing companies will pay for all the costs of their production. This would cut down on the level of output and reduce environmental problems. It will also reduce the rapidity with which the oil resource is depleted, and the inter-generational resource gap. This gap could also narrow further when people become more concerned about the direction of government expenditure, since they would pay tax and require the government to be accountable to them. This may force the government to invest more in infrastructural development and the provision of production incentives to expand income and increase tax revenue.

## 5. Conclusion

Land and other natural resources are economic goods that are scarce and have positive prices. Private ownership of these resources guarantees better social outcomes than direct ownership by any public authority, be it community, local, state or federal. This is because under private ownership, the over-use of property is contrary to profit maximization. Common ownership is fraught with reckless use of the property in question, and results in over-exploitation of the resource. Public ownership is also inefficient because the relative scarcity of resources is not reflected in the prices of those goods. As a result, prices are not an important factor in resource allocation under public ownership and only generate more problems than are solved. Transaction and agency costs in the public sector ownership and control of land are higher than under private sector control. Private ownership and control of resources, because they ensure efficient use of resources, are necessarily better than public ownership and control in the protection of environmental quality. They are also a sure way of guaranteeing that

the producers pay economic prices for all the resources used in their production activities.

The current environmental problems in the oil producing Niger Delta region is partially due to government's control of land and mineral resources, and partly also on account of government direct investment in oil production. The former generates sub-optimal results similar to the 'tragedy of the commons'. The latter makes the government behave like a private business operator who is not interested in bearing the costs of the removal of environmental externalities generated by his production activities unless some penal or incentive conditions are introduced. If the ownership of resources is restored to the private individuals, the government can then enforce the regulation of environmental standards using appropriate taxation tools. Besides, the government would also be able to raise revenue from the landowners by taxing their rental earnings.

## References

- Akpan, G.E. 1999. Fiscal potentials and dependence in Nigeria. In: *Fiscal Federalism and Nigeria's Economic Development*. Proceedings of the 1999 Annual Conference of the Nigerian Economic Society, 73-100.
- Akpan, G.E. 2000. Fiscal alternative for government participation in petroleum resource exploitation: Nigeria's policy direction for the 21<sup>st</sup> century. Paper presented at NES 2000 Annual Conference.
- Atuah, Valentine I. 2003. Microbes in environmental pollution management. In: *Environmental Pollution and Management in the Tropics*. E.N. Adinnu, B. Ekop and V. I. Atuah, eds. SNAAP Press Ltd., Enugu, pp. 195-202.
- Alchian, A. 1998. Property Rights. In: *The New Palgrave: A dictionary of economics*. Macmillan Reference, London.
- Constitutional Rights Project (CRP). 1999. *Land, Oil and Human Rights in Nigeria's Delta Region*. CRP, Lagos.
- Demman, D.R. 1964. Land in the market: A fresh look at property, land and prices. Hobart Paper. No. 30.
- Frank, R.H. 1997. *Microeconomics and Behaviour*, 3<sup>rd</sup> ed. McGraw-Hill, New York.
- Goldstein, J. 1996. *International Relations*, 2<sup>nd</sup> ed. Harper-Collins, New York.
- Hardin, Garrett. 1968. The tragedy of the commons. *Science* 162: 1243-1248.
- Holsti, K.J. 1995. *International Politics: A framework for analysis*, 7<sup>th</sup> ed. Prentice Hall, New Jersey.
- Iwayemi, A. 1990. Oil and Nigeria: The good, the bad and the ugly. Faculty of the Social Sciences, University of Ibadan, Ibadan.
- Iwayemi, A. 1995. Oil and the Macroeconomy: A perspective on recent economic performance. In: *Macroeconomic Policy Issues in an Open Developing Economy: A case study of Nigeria*. A. Iwayemi, ed. NCEMA, Ibadan.
- Iwayemi, A. 2001. *Nigeria's Fractured Development: The energy connection*. Inaugural Lecture Series. University of Ibadan, Ibadan.
- Krautkraemer, Jeffrey A. 1998. Nonrenewable resource scarcity. *Journal of Economic Literature* 36: 2065-2107.
- Pinto, Brian. 1987. Nigeria during and after the oil boom. A policy comparison with Indonesia. *The World Bank Economic Review* 1(3): 419-445.



Ryan, Alan. 1998. Property. In: *The New Palgrave: A dictionary of economics*. Macmillan Reference, London.

Yohe, G. and P. MacAvoy. 1987. A tax-cum-subsidy regulatory alternative for controlling pollution: Insight from thinking about acid rain. *Economic Letters* 25: 177-182.