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# Mainstreaming of sustainable development in national and sectoral budgets

## Introduction

Since its popularisation in the World Commission on Environment and Development (WCED) report (1987), sustainable development (SD)<sup>1</sup> has come to mean many things to many different people. For example, some writers have tended, based on their narrow focus on production parameters, to view SD as a process of achieving a buoyant economy with continued economic growth (Stepanov, 2004; Adesanya, 2004; Runnalls, 2008). Others have tended to focus on the biophysical environment and contend that the major tenet of SD is achieving ecological balance (Taranets & Alyona, 2004). However, the process goes beyond what is expressed in these two narrow perspectives, to include what humanity and nature require for their coexistence currently and in the future. This last perspective is particularly evident in *Our Common Future* which states that SD is ‘a process in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations’ (WCED, 1987:43). Despite the varying definitions, what remains consistent is the need to address interconnected issues, inclusive of environmental degradation, hunger, resource inequality and deprivation, and poverty. These issues remain pivotal to social and economic advancement, and environmental protection. As such, for SD to have any practical meaning for the average citizen, it must encapsulate the principles of human development, equity and social justice, pursued within the restraints of life’s support systems on our planet (Kates, et al., 2005).

Given the evolving definition of sustainable development, many small island developing states (SIDS)<sup>2</sup> have been seeking to pursue the principles of sustainable development as essential and integral components of their development agendas. However, efforts now need to shift in some cases and be continued in others, to policies and projects, known as ‘mainstreaming’, that promote integration of sustainability principles into development strategies, plans, programmes and budgets, rather than as an ‘add-on’ component. Rather, sustainable development principles must have a central role in the national and sectoral budgets of SIDS if their peoples are to enjoy a better quality of life.

Through mainstreaming within national and sectoral budgets SD principles are expected to support the attainment of the Millennium Development Goals (MDGs) of the United Nations (UN). These goals include halving the proportion of people living below the poverty line; halting and reversing the spread of HIV/AIDS; halving the proportion of underweight under-five year olds; halving the proportion of people without access to safe drinking water;

and achieving universal primary education. Others include reducing maternal mortality ratios by three-quarters; reducing under-5 mortality by two-thirds; reversing the loss of environmental resources by 2015; and achieving equal access for boys and girls to primary and secondary schooling by 2015.

The purpose of this chapter is two-fold. In the first instance, it seeks to introduce the reader to the benefits of using national and sectoral budgets within SIDS to mainstream SD concerns. Secondly, it demonstrates, both theoretically and practically, the range of techniques available, indicating their strengths and weaknesses where possible. The remainder of the chapter looks at the reasons for mainstreaming SD concerns. In the third section we present a discussion on the nature of the problem, while the final section presents the approaches available via national and sectoral budgets for mainstreaming, presenting a case study example to demonstrate the applicability of one of the approaches. The chapter concludes by synthesising the discussion presented and highlighting a few considerations for SIDS in seeking to apply these approaches.

### **Why mainstreaming within the national and sectoral budgets?**

As the former United Nations (UN) Secretary-General, Mr. Kofi Anan, noted in 2001, the greatest challenge about SD is how to translate it into practical realities in the lives of people. The framework of mainstreaming SD into national and sectoral budgets, would require revisiting and reorienting existing development paradigms<sup>3</sup> followed in many SIDS to include a clear focus on the inclusion and expansion of budgetary instruments related to sustainability. Necessary objectives, therefore, would include the fostering of creative and innovative budgeting, effective planning, and applying appropriate information and communications technologies.

Furthermore, using national and sectoral budgets in SIDS to mainstream SD requires systematically seeking to incorporate these concerns as early as possible in the decision-making process. Such inclusion can facilitate the aligning of policies, plans, and programmes along with the long-term requirements of SD. Additionally, the benefits that can accrue from SD mainstreaming in the budgetary process are manifold, and include the following:

- i) since mainstreaming places emphasis on a precautionary approach it can aid in anticipating and avoiding negative consequences of inadequately designed plans, inappropriate budgeting, and wasteful spending of valuable resources;
- ii) helping to deal with cumulative and indirect impacts from all projects, even those considered small, allowing all resources to be properly accounted for; and
- iii) giving environmental concerns a status on par with social, economic, and cultural considerations.

But why should governments, particularly in SIDS, be concerned with, *inter alia*, 'greening' their budgets?

The answer to such a question is not necessarily straight-forward, although beginning to incorporate SD parameters into national and sectoral budgets will commence the process of conveying to resource users that some ecosystem goods and services are not free, thus encouraging greater value to be attached to such resources. Additionally, given the limited

resources present in some of these SIDS relative to their demands (IPCC, 2007), it is helpful to use a mainstreaming approach that allows for prioritisation of development efforts as it may be a futile exercise trying to carve out another separate budgetary head called 'Sustainable Development'. In fact, conceptually, SD is not a separate issue at all, but should be integrally woven within the fabric of a number of other developmental objectives! At the same time, it is inappropriate to assume that sustainable development lies solely within the precinct of natural science, as it is equally a cross-cutting issue impinging on cultural values, ethics, and human behaviour with significant relevance to the humanities and social sciences.

It has to be recognised that the budgeting processes in many SIDS are politically charged since critical decisions have to be reached about the most appropriate allocation of scarce resources, given the many demands that include:

- i) aspiring to fulfil the MDGs mentioned earlier;
- ii) undertaking rehabilitation and construction of infrastructural projects necessary to ensure that their goods and services remain internationally competitive, while facilitating growth expansion in these economies; and
- iii) meeting debt servicing payments to remain internationally solvent (Runnalls, 2008).

But inappropriate budgeting can aggravate the social and environmental degradation problem in seeking to meet the expanding demands of a growing population. This occurs when budgets explicitly or implicitly undervalue or do not allocate sufficient resources to manage social and ecological goods and services<sup>4</sup>. In some instances, they may cause the carrying capacity<sup>5</sup> of biological systems to be exceeded or non-renewable resources to be diminished<sup>6</sup>.

Lastly, via taxes, subsidies and other innovative budgetary methods, governments can constrain, stimulate or otherwise guide economic behaviour<sup>7</sup>. Unfortunately, too many policies still work counter to, or are disconnected from, the wider goal of long run sustainability. Instead, policies, taxes, subsidies and other budgetary mechanisms should be aimed at harnessing economic behaviour that is both socially and environmentally sound.

The current 'base budget' approach of 'let us see what we gave them last year and give them a bit more' keeps providing institutions who are not necessarily pursuing SD to do the same, only a little more of it year after year. What would seem necessary to meet the challenges of SD for SIDS in today's changing global environment is for all budgetary officers to seek to justify the existence of their programmes and the resources required in answer to the following questions:

- 1 What is the justification for the existence of this ministry or agency, does it need to exist, or could another agency in the public or private sector do the job better? Why was the ministry or agency set up, what problems is it trying to solve and how is it proposing to integrate SD principles in its programmes; (functional and legislative intent)?
- 2 How has the problem changed since the agency's creation; i.e., how has the outside world changed, how does the problem manifest itself in today's environment, how extensive is it and who is affected by it? What further adaptation is required to keep pace with the defined trends (adaptive capacity)?
- 3 What plans exist that identify the problems to be solved, and what resources and

timescale are required to implement these plans, that justify the agency's budget request (zero-based budgeting)?

The budget-setting process provides the prime opportunity to help agencies renew their missions and create plans to solve the SD problems consistent with their legislative mandate and justify their respective budgets.

## **Market failures, environmental degradation and social inequity**

Environmental degradation and social inequities remain important sustainability issues in SIDS. To be in a position to adequately address them, it is necessary that attention is focused on the root causes of these problems. The essential economic root causes of environmental degradation and social inequity are cited as pricing and poverty (Hollander, 2003; Duraiappah, 2008). However, this chapter concentrates on dealing mainly with the pricing problem since this is primarily what economic instruments seek to rectify through the budgetary process and the reallocation and redirecting of resources. The issue of pricing can further be broken down into four components: externalities, under-pricing, the lack of markets for environmental services and policy failure (Barbier, 1992 & 2007; OECD, 2000).

**Externalities**, whether positive or negative, are often used to refer to a situation where the spin-off effects of production or consumption behaviours are imposed on others but cannot be traced or charged back to the source. The main characteristic of an externality is the separation between the affected individual and the source of the effects. Because of this, it is difficult to get the perpetrator to pay for the costs of the harmful effects or to reimburse those who created the cost to society. Thus, externalities are not built into the market price of a good or service. Furthermore, since many ecological services are public goods<sup>8</sup>, managing these resources tends to fall to governments to ensure equity and social justice (Pagiola et al, 2003).

**Under-pricing** occurs when all the costs of an input or activity are not included in the price of an output. This is particularly the case for many environmental resources. For example, since the role forests play in regulating climate does not reach the market, this function is often not priced. This is generally due to the fact that the free market system only makes provision for pecuniary costs<sup>9</sup> and not the environmental and social costs of production. Environmental economics seeks to incorporate non-pecuniary costs into the price of outputs through shadow pricing, economic opportunity costs, and contingent valuation techniques (Diamond and Hausman, 1994; Portney, 1994). Further, through the budgetary process, governments can charge these non-pecuniary costs against the public purse.

**A lack of information** also leads to incorrect pricing because it gives a distorted impression of the scarcity of a resource (Stiglitz, 2002). However, while insufficient information can lead to a commodity being overpriced, it is when it leads to under-pricing that environmental degradation is most likely to occur and the achievement of sustainable development principles becomes so much more difficult.

**Government policies** are also common causes of under-pricing. Through government subsidies for certain inputs, such as agro-chemicals in the agricultural sector, the consumer

bears less cost and thus gains a false impression of the (non)scarcity of a resource. Furthermore, the 'lower' cost will tend to induce an individual to use more of a resource (which is after all the point of a subsidy) with the possible consequence of negatively affecting some other resource in the process. For example, using too much fertiliser often leads to contaminated groundwater.

The final market failure has to do with situations where no property rights (and hence no market) exist for certain goods (whether resources, services, or products used by producers or consumers). These are generally referred to as open-access resources or public goods which are usable by all without payment, such as the air, the fish in the sea and common land. Since such resources are difficult to value, they tend to be overexploited due to their negligible user charges (Munasinghe, 1993; Pearce and Markandya, 1989).

### **Tackling the problem**

It is a well-established fact that the market in many SIDS fails to contribute towards environmental protection and social advancement, two critical goals in the pursuit of sustainable development, because of a pricing problem. The function of price, and hence the market, is to allocate resources efficiently. However, when it comes to many ecological goods and services, they are often zero rated, making it difficult for the market to allocate these resources in their optimum capacities. Historically, governments have sought to deal with the under-valuing of these resources in relation to the market by distributing them (sometimes directly and at other times through privatisation) via the definition and enforcement of property rights. Prices are a consequence of the distribution of property rights that underlie market exchange. Theoretically then, if a government were to define property rights in such a way that allowed for efficient pricing of ecological goods and services, then their actual scarcity and cost would be reflected in these prices, and since economic theory holds that price is a reflection of value (Stavins, 2005), environmental degradation resulting from economic activity should then decline.

From this follows the redefinition of the role for governments within SIDS in seeking to pursue the principles of sustainable development. At least three options are available to governments for this purpose:

- i) to educate consumers so that they can make more informed decisions and be aware of the impact their actions and consumption behaviour may be having on the pursuit of SD;
- ii) to place quotas on the use of certain resources or ban producers from using them altogether since they are strategic in sustaining life on earth; and
- iii) to create market-based incentives (MBIs)<sup>10</sup> to induce both consumers and producers to adjust their behaviour.

The advantages of MBIs are that they tend to encourage consumers and producers towards efficient choices, save scarce resources, and reduce transaction costs. However, they are difficult to implement in many SIDS because of a limited information base and less than efficient markets.

As such, governments in general have been more inclined to adopt what has been referred

to as a command-and-control (CAC) strategy. In other words, they regulate activities that degrade the environment, that encourage social deprivation, and that exacerbate poverty in accordance with some legislated or agreed performance or technology standard (Keohane and Olmstead, 2007). In some cases this involves the use of quotas or bans for restricting the use of renewable resources such as fish and prawns, restrictions on air pollution emissions, controls on hazardous waste transport and dumping, zoning laws, ambient water and air quality standards, and the type of technology to be employed. These controls are usually mandatory and enforced through litigation, licensing and fines and other penalties for non-compliance.

However, there are certain disadvantages to the command-and-control approach. Regulations can be difficult to enforce and costly to administer. Furthermore, rising costs and budget constraints have made regulation less attractive than economic instruments with their promise of efficiency and built-in compliance. Additionally, regulations tend to offer lesser incentives than MBIs for exploiters of the environment to attain standards higher than those imposed by the law (Stavins, 2001). They are also generally inflexible. Those subject to regulations may have no choice on how they reach these environmental and social goals. Logistics pose an additional problem. Pollution, for instance, may be caused by a large number of individuals making it difficult to enforce standards. Finally, consumers may have little financial incentive to purchase 'environmentally-friendly' goods. 'Green' products are often more expensive than conventional products (Bynoe and Bettina, 2004).

With the realisation that regulation is not as effective and efficient as it could be, the focus has swung towards the use of budgetary instruments. Budgetary instruments are policy measures which explicitly affect private cost and benefits. The motivation behind their application, and of particular relevance for SIDS, is that rational decision makers will base their decisions on a comparison of various options. Their rational choice will tend to be the option which has the least cost for the number of benefits received, based on current and historical information available to the decision maker. Budgetary instruments therefore can make SD-appropriate behaviour more rewarding to the decision-maker. In this way individuals may be induced to change their behaviour and freely choose a more socially desirable alternative.

This rationale is based on the arguments of AC Pigou in *The Economics of Welfare* (1932) dealing with the divergence between private and social costs, resulting in externalities. Pigou was of the opinion that the party causing damages, such as the destruction of mangrove forests necessary for coastal defence, for example, should be forced to compensate the victim. Since it is not always easy to compensate every individual affected by a negative social action because of difficulty in identifying the party due to the fact that there are many persons causing the externality, or a lack of clearly define property rights (Coase, 1960: 28–31), the offending parties should have to pay the state who will then decide how to allocate and distribute the resulting funds. This is what led to the adoption of the polluter pays principle by the Organisation for Economic Co-operation and Development (OECD) countries in 1972, and why it continues to be advocated for implementation in many SIDS.

A commonly used theoretical instrument under this regime is the Pigouvian tax. This tax

is usually set equal to the pecuniary value of the marginal damage caused by pollution at the point of 'optimal' pollution. Optimal pollution is not a point of zero pollution but rather a point at which the cost of reducing pollution any further outweighs the environmental, social and economic benefit received. At this point, the net benefits to society will be their greatest. Implementing such a tax is not without its problems, however. Firstly, it is next to impossible to determine the optimal level of pollution (due to difficulty in measuring the value of the damage and the cost of clean-up). Secondly, it is also difficult to calculate the level of tax required to achieve it. In practice, environmental taxes are often set at one level and then iterated up or down depending on their effect. In some cases repair of environmental damage is impossible (species extinction, for example) (Pearce, 1988).

Policy-makers, having been confronted by this problem with Pigouvian taxes, have found other ways of approaching the result. They have resorted to charges, fees, tradable and marketable permits. However, they have also recognised that similar results can be achieved by providing compensation for not using polluting substances or technologies. Subsidies, tax allowances, and grants have been used in this manner. Other policy-makers have opted for a combination of the two approaches utilising deposit-and-refund systems, distributive credits and fee-bates (Barbier, 1992; Gale and Barg, 1995). In some cases, policy-makers have even adopted a victim pays stance whereby similar methods are used to get victims to compensate polluting parties for not being able to pollute.

### **Choosing a budgetary instrument**

There are at least three main categories of budgetary instruments to mainstream SD principles in national and sectoral budgets. These instruments are: public expenditure instruments (PEIs), revenue generating instruments (RGIs), and budget neutral instruments (BNIs). Within these categories, policy-makers have a variety of options as discussed below. It is important to realise, however, that these instruments can have positive or negative effects in the pursuit of sustainable development depending on how they are implemented. Further, it is important to note that to achieve sustainable development it may be necessary to have an array of design elements that can assist to improve policy results. However, what will be necessary is that the elements are designed in a complementary fashion. This is important since the effects of these instruments may be neutralised by other policies which have not taken SD consequences into consideration, such as increased soil erosion that would affect food production and ultimately livelihoods and food security. Policy-makers need to take account of these factors and other criteria when choosing an instrument to achieve a certain SD goal. It has also been found that budgetary instruments can be most effective when used in conjunction with regulation (Barbier, 1992; Gale and Barg, 1995).

### **Public Expenditure Instruments (PEIs)**

Public expenditure instruments (PEIs) take the form of subsidies, grants and tax allowances and are familiar tools of intervention to achieve a specific policy objective. This is generally because, for governments, it is more politically acceptable to hand out benefits than to impose costs on individuals. The possible application of PEIs in SIDS would be to provide a

financial incentive for individuals and firms to undertake an SD activity that they would not otherwise have undertaken. For example, in Sri Lanka, the government has often provided grants to research institutions to develop environmentally-friendly technologies. Similarly, in Singapore, through elements of CAC at the beginning and later on price support, policy-makers have taken steps to encourage the development of the recycling industry. Other countries have used tax allowances to improve energy conservation.

Further to the political palatability of PEIs, there are other substantial reasons why some SIDS governments may feel justified in providing financial assistance to producers in certain markets and industries. For example, it is often argued that given that one of the objectives of SD is to reduce poverty (which remains a main threat to the environment), the application of PEIs can control the rate of inflation and boost real living standards, particularly of lower income households, thus facilitating the poverty-mitigating objective. Furthermore, the use of PEIs are believed to encourage the provision and consumption of merit goods and services which are said to generate positive externalities in the form of increased social benefits, while conversely under-consumption or insufficient provision of merit goods can lead to market failure, causing a loss of social welfare, and a greater difficulty in achieving the SD principles.

Other attractive features of PEIs that help in the achievement of the SD goals are that they can maintain or increase the revenues (incomes) of producers during times of vulnerability or commodity price troughs. Since the effects are often felt most by low-income households, through providing support to these households, governments, via the budgetary process, are able to tide families over in difficult times.

But one of the strongest arguments for the use of PEIs in seeking to mainstream SD concerns in national and sectoral budgets is that they tend to reduce the cost of capital investment projects, which can, in the future, help to stimulate economic growth by increasing long-run aggregate supply. This strategy also has the possibility of increasing employment opportunities and hence the livelihood of a number of households. Once this is not done at the expense of the environment, it remains a viable option for pursuing SD in SIDS.

Despite the obvious attractions of PEIs, there are a number of issues with these measures which policy-makers need to understand in seeking to apply them to promote SD principles. At all times, the economic and social case for PEIs should be judged carefully on the grounds of economic efficiency and also fairness (or equity). It is always important to be careful to measure and evaluate who gains from any particular PEI and who pays. For example, the final cost of a subsidy usually falls on consumers (tax payers) who themselves may have derived no benefit from the subsidy. A question that must be asked, therefore, is might the money used up in PEI provisions be better spent elsewhere? These are critical choices which policy-makers will be called upon to make, and can be assisted in such decisions through the application of other techniques, such as cost-benefit analyses. PEIs inevitably carry an opportunity cost and in the long run there might be better ways of providing budgetary support to producers and employees in specific industries.

Neo-classical economists have argued that PEIs distort the workings of the free market

mechanism, leading to a misallocation of resources, and can eventually lead to government failure where government intervention actually leads to a worse distribution of resources and further debilitating rather than enhancing the effect on SD. For example, export subsidies distort the free trade in goods and services and can severely curtail the ability of SIDS to compete in the markets of some industrialised countries.

Additionally, it is contended that the opportunity cost associated with PEIs can be substantial, with governments artificially protecting inefficient firms that may need to restructure, delaying the need for economic reforms from which resources can be acquired to promote social and environmental programmes. As such, some economists have argued for alternatives that have less distorting effects, such as direct income support (Feldstein, 2008) through a tax and benefit system to support families in some SIDS that may be living on the margins of poverty.

### Revenue generating instruments (RGIs)

Revenue generating instruments (RGIs) include taxes, charges<sup>11</sup>, and fees<sup>12</sup>. In seeking to implement budgetary measures in SIDS to mainstream SD principles and issues, there are at least three important considerations. The first is to note that the behavioural response of stakeholders affects the effectiveness and often the revenue consequences of RGIs, depending on the elasticity of demand with respect to price; with low elasticity, as with tobacco tax, demand may decline but government revenue increase. Second, the effects on economic efficiency or deadweight loss<sup>13</sup> depend on stakeholders' compensated behavioural responses, i.e. on the behavioural effects excluding pure income effects (Feldstein, 2008). And, third, behaviour is important for understanding the short-run macro-economic consequences of RGIs on aggregate demand and employment.

Unfortunately, there is no reason to be pleased about the analysis in policy discussions of the efficiency effects of RGIs. This is so because despite policy-makers understanding that higher taxes hurt the economy by distorting behavior – reducing work effort, saving, and risk-taking – there is often little attempt to quantify these adverse effects or translate them into reductions in economic efficiency.

Similarly, the short-run macro-economic consequences of RGIs in SIDS, such as tax changes, depend to a large extent on how monetary policies are amended in response to the tax change. If a tax change produces a fiscal stimulus that exceeds what the Central Bank in some SIDS believe to be prudent, they may neutralise it by raising interest rates. Alternatively, a fiscal stimulus may simply substitute for an easier monetary policy that the Central Banks would otherwise implement. As a general rule, it would seem best to assume that a change in fiscal stimulus would be offset by the induced change in monetary policy. One exception would occur when interest rates are so low that the Central Bank cannot lower rates any further. In such a liquidity trap, a fiscal stimulus would raise aggregate demand. A second exception would occur when financial market conditions or the availability of bank capital make it difficult for the Central Bank to stimulate economic activity. In this case, the Central Bank would welcome a fiscal stimulus and would not seek to offset it. Because of these exceptions to the general rule, the possible fiscal stimulus effect of a tax change must be considered on a case-by-case basis to assess the likely reaction of the Cen-

tral Bank to the proposed change in tax rates or tax rules. Note that this discussion of the cyclical effects of tax policies is very different from the longer-term supply side effects of tax changes on GDP that cannot be offset or reversed by monetary policy. As more SIDS move towards regional policies on fiscal and monetary integration they will become more affected by common guidelines on such policies.

When deciding on an RGI to implement, it would also be desirable to know what current or future change in taxes or spending will be made to maintain an unchanged level of national debt. This would be easy if the purpose of the tax increase is to finance some particular programme, e.g., a revenue increase to fund increased social service benefits or to allow the elimination of another tax like the alternative minimum tax. In such cases, SIDS should follow the same analytic approach that was done by Richard Musgrave and others in their studies of tax incidence, i.e., to assume a concurrent budget balance achieved by a lump sum change in taxes or spending (Musgrave, 1957).

In short, RGIs are viewed, to some extent, as the 'price' to be paid for affecting development and the environment. RGIs have both an incentive impact and a revenue impact. The incentive impact is that those firms that are able to reduce their impacts, whether through innovation or other means, are able to take advantage of the incentives presented, stealing a march on their competitors and increasing market share (Porter and van der Linde, 1995).

But RGIs also have the effect of increasing the price of a particular good or service being paid by consumers, *ceteris paribus*, resulting in less of that commodity being demanded. RGIs also have effects on investments and share prices. For example, taxes embedded within supply costs (e.g. tax on labour costs) will reduce the amount of capital that can be purchased with \$1 of investment, whereas a subsidy will have the opposite effect, allowing \$1 of investment to purchase more capital. Embedded taxes in supply prices can be bad for business because it means that they have to borrow more money to finance a project with a given expected amount of return, while the opposite is true when supply prices are reduced through subsidies (or through a competitive market).

But in practice, taxes, charges and fees tend to be too low to have any effect on environmentally-damaging behaviour and so serve mainly as revenue generators (Bynoe, 2001). Usually this income is earmarked and used for clean-up operations, new abatement technologies or subsidising new investment. Effluent charges on sulphur dioxide emissions, tax differentiation between leaded and unleaded petrol, user charges for public waste disposal, depletion taxes on mineral exploitation and stumpage fees for timber demonstrate how RGIs are used (Gale and Barg, 1995).

## Budget neutral instruments

Budget neutral instruments (BNI) represent a relatively new class of instruments within the policy arena, the most common of which is the deposit refund scheme. These deposit refund schemes are desirable instruments for environmental and social regulation where monitoring of emissions is difficult (see the example in the case study below, where monitoring is generally difficult, policy-makers are opting for budget neutral instruments, though not

always with the desired result). Such systems may gain additional political acceptability, however, if implemented so that no net revenues accrue to the SIDS government. The revenue neutrality constraint causes the deposit to drop below the efficient level, and the refund to rise. The extent to which this constraint leads to efficiency losses varies with the price elasticity of demand, with compliance costs, with the degree of correlation between willingness to pay and compliance costs, and with the magnitude of the externalities.

Furthermore, the deposit refund schemes are designed to lay a surcharge on a potentially harmful substance or activity and then refund that surcharge if that substance is recycled, restored or use is avoided. In such cases, the government acts as the intermediary, transferring funds from one group to another. To date there are three types of BNIs in use, viz., deposit refund schemes, fee-bates, and distributive credits. Common deposit refund schemes are for the recycling of glass and plastic bottles, aluminium cans and other containers. This provides the government the opportunity to achieve a particular objective without having to incur the cost to do so. Given the limited resources that most SIDS are working with, this remains an attractive option.

Fee-bates refer to a system where producers or consumers of certain substances are required to pay a certain rate for that action regardless of the legal limits permitted. Those who consume or produce less of the substance than the legal limits are then compensated for restraint. Those consuming or producing more than the legal limit receive little or no compensation depending on how the system is set up. Examples of fee-bate systems would be reforestation rebates on timber stumpage fees. Distributive credits are most often used in the area of waste management where a credit against waste collection fees is offered to households who recycle their waste. The credit should theoretically be equal to the savings incurred by not having to collect and process this waste and therefore remains an attractive policy option for governments.

#### CASE STUDY

##### **Institutionalisation of an environmental bond on the small scale gold mining sector in Guyana**

#### **The policy in brief**

**Economic instrument:** An Environmental Bond

**Problem:** The gold mining sector of Guyana is dominated by small itinerant miners whose activities cause severe environmental problems in terms of freshwater pollution, soil degradation and erosion, and the destruction of some valuable tree species. But it is difficult to monitor these miners' activities because of their itinerant nature and limited capacity within the monitoring agency.

**Goal:** To transfer the responsibility for environmental protection to the miners; to encourage miners to internalise the environmental costs of their activities; and to provide an incentive for miners to seek the most cost effective way of conducting their operations.

**Description:** The mining sector is one of the most important sectors in the Guyanese economy contributing 13 per cent of the country's gross domestic product (GDP), 35 per cent of its export earnings and employing approximately 5 per cent of its labour force, whose activities present a number of environmental and social challenges. To regulate the small miners, the responsible agency, i.e., Guyana Geology and Mines Commission (GGMC), has used command and control (CAC) for regulating the sector in an effort to reduce environmental damage and encourage sustainable development, through instituting an environmental bond on each small miner before they receive their licences. This bond amounts to approximately US\$1,000 and is expected to be a deterrent to miners destroying the environment, polluting water ways, and disrupting rural livelihoods.

**Administering institution:** Guyana Geology and Mines Commission (GGMC)

**Key stakeholders:** Miners, the Guyana Gold and Diamond Miners Association, Environmental Protection Agency, and Amerindian Associations.

## An Overview

The gold mining sector remains pivotal to Guyana's development thrust. The sector is dominated by small- and medium-scale miners. In seeking to pursue sustained development, the Government of Guyana amended its Mining Act in 1989. The amended Mining Act, No. 20 of 1989 provides the legal framework governing the utilisation of mineral resources in Guyana, including aluminium, gold, precious stones and quarriable materials. The Act vests all materials in Guyana in the State, but preserves the rights of persons in possession of land grants before 1903 to all base metals, as well as the privileges of Amerindians in relation to prospecting, mining, and quarrying for any mineral. Additionally, the Act provides for a system of mineral agreements and licences for the regulation of prospecting, mining, and quarrying activities; and integrates plans to deal with social and environmental issues arising from mining activities.

As such, licensees must put forward work proposals and show technical competence when applying for a mining licence. No mining licence can be issued unless the GGMC is satisfied that the applicant would pursue cost-efficient and optimal use of the mineral resources concerned. Mining licences may be granted subject to conditions that include the process used to mine minerals. Further, a performance bond for adherence to these conditions can be required. Also, licensees may only dispose of, stack or dump any mineral or waste product resulting from mining in a manner approved by the GGMC.

Based on a memorandum of understanding (MOU) that the GGMC signed with the Environmental Protection Agency (EPA), the GGMC is to work to ensure that miners integrate environmental protection in all their mining activities. Currently, large-scale mining operations are subject to an environmental impact assessment (EIA) as provided for under the Environmental Protection Act, while medium-scale miners are expected to prepare an Environmental Management Plan (EMP) which is a legally binding document, before they are issued a mining licence. However, there is no such provision under the EP act for small-scale miners.

Recognising that regulating small-scale miners is also important, if decidedly more difficult, the GGMC drafted and implemented an Environmental Management Agreement (EMA) for these operations in 1994.

The EMA covers all aspects of mining, including the use of equipment, sedimentation control, vegetation removal, storage and disposal of chemicals and fuel handling, and the use of mercury. Specifically, it attempts to transfer the responsibility for managing the environment to the miners and states that:

‘The Miner shall be responsible for all damages to the environment resulting from normal mining activities within the boundaries and confines of the areas stipulated in the Agreement, until formally discharged, in writing, by the Commissioner of all obligations under the Agreement.’

A significant component of the EMA is the institutionalisation of an **environmental bond**. This bond is in the form of a fixed sum of G\$200,000 (US\$1,000) to be deposited with the GGMC before the miners commence operations. Upon completion of one’s mining activities and to the extent that the GGMC is satisfied that the environment was returned to an acceptable manner and that every effort was taken to minimise environmental damage, the entire bond may be recouped by the miner. If not, a part of, or the entire bond may be used to restore the physical environment. This approach was expected to be budget neutral and aid in the sustainable development process.

## Policy issues

The drive to institute this bond was occasioned by events occurring at the Earth Summit in 1992, and later Guyana’s drive to demonstrate that it was committed to the principles of sustainable development. Furthermore, the cyanide spillage by a large external mining interest in 1995 further demonstrated the need to institute even firmer regulations on the sector. This was occurring at a time of great interest in Guyana’s gold mining industry due to a buoyant gold market.

### Results:

- As of 2006, less than 10 per cent of miners had reclaimed their bond as many preferred to forfeit the sum and continue with their normal *modus operandi*.
- While the bond was expected to be revenue neutral it has resulted in increased public expenditure as it was indirectly subsidising the small miners, given that the rate was set very low.
- Environmental degradation has continued almost unabated.

### Lessons:

- While command and control measures can be effective like the environmental bond, it is necessary to conduct some preliminary work to ascertain what a realistic fee is. A fee set too low would result in what we see and one too high can discourage persons entering the sector.
- These measures work best when most persons are onboard. This idea was vehemently opposed by the miners’ associations and the small miners. Discussions before implementation are useful in moving forward.

## Conclusions

This chapter sought to provide an overview of the evolution and applicable budget instruments available to policy-makers in SIDS for the mainstreaming of sustainable development principles in national and sector budgets. It sought to establish the need for a mainstreaming approach, given the resource constraints of many SIDS, the cross-cutting nature of a number of the issues, and the often tangential manner in which they are treated.

It identified three main sets of instruments and looked at both their strengths and weaknesses. Clearly, no one set of measures is more efficient than the other, but rather all have some degree of merit and would tend to benefit the SIDS more should they be pursued jointly and in a complementary manner. While there has been a case for the application of economic instruments to replace the often applied CAC in most SIDS, their relatively weak market structures and lack of information has often precluded the effective implementation of these instruments for the attainment of SD. However, this has not prevented economists from noticing the potential which economic instruments offer, particularly in advancing technological innovation and development. This can particularly be seen in the adoption of fee-bate and distributive credit systems. The focus in the application of economic instruments has also shifted to one of prevention rather than cure. They are no longer used to generate revenue to cover clean-up costs but rather to act as incentives for individuals to change their behaviour. These findings are increasingly being backed up by empirical evidence.

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## Environmental economic websites

- <http://www.ecosystemvaluation.org>
- <http://lnweb18.worldbank.org/ESSD/envext.nsf/44ByDocName/EnvironmentalEconomicsandIndicators>
- <http://www.elaw.org/resources/text.asp?id=1999>
- <http://www.ucl.ac.uk/~uctpa15/envecontexts.pdf>
- <http://www.elaw.org/resources/topical.asp?topic=Economics>
- <http://www.elaw.org/resources/text.asp?id=2039>
- <http://www.darp.noaa.gov/legislat.htm>
- <http://www.elaw.org/resources/text.asp?id=1997>
- <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/homepage>
- <http://www.whitehouse.gov/omb/circulars/a094/a094.html#top>
- <http://www.elaw.org/resources/text.asp?id=1976>
- <http://www.elaw.org/resources/text.asp?id=1978>

## Useful internet searches on the natural resources economics

- International Experiences with Economic Incentives for Protecting the Environment.
- Economic Impact of Tourism Visitation at National Parks in the U.S.
- Estimating National Park Visitor Spending and Economic Impacts – The MGM2 Model.
- Valuing Environmental and Natural Resources: The Econometrics of Non-Market Valuation: Eco-Economy: Building an Economy for the Earth.
- ConservationEconomy.net
- Economics, Trade Policy, and CITES (Convention on the International Trade in Endangered Species).
- Environmental Valuation Reference Library.

## Notes

- 1 Sustainable development is defined as development '... that meets the needs of the present without compromising the ability of future generations to meet their own needs'. World Commission on Environment and Development (WCED) (1987), *Our Common Future*, Oxford University Press, New York, p. 8.

- 2 While not a homogenous mass, many have common features according to the IPCC (2007) that include small land masses surrounded by ocean, and are frequently located in regions prone to natural disasters, often of a hydrometeorological and/or geological nature. In tropical areas they host relatively large populations for the area they occupy, with high growth rates and densities. Many small islands have poorly-developed infrastructure and limited natural, human and economic resources, and often small island populations are dependent on marine resources to meet their protein needs. Most of their economies are reliant on a limited resource base and are subject to external forces, such as changing terms of trade, economic liberalisation, and migration flows (Briguglio and Kisanga, 2004).
- 3 Some persons have argued for a 'top-down' approach (governments and international organisations being the main agents of change), while others have argued for a 'bottom-up' approach (community and civil society organisations are the main agents of change) to economic development. Others, like the development assistance agencies, have focused on structuralist and trade models to encourage development.
- 4 These are the benefits arising from the ecological functions of healthy ecosystems. Such benefits accrue to all living organisms, including animals and plants, rather than to humans alone. Examples of ecological goods are clean air and abundant fresh water, while ecological services include purification of air and water, maintenance of biodiversity, decomposition of wastes, soil and vegetation generation and renewal, pollination of crops and natural vegetation, groundwater recharge through wetlands, seed dispersal, greenhouse gas mitigation, and aesthetically pleasing landscapes
- 5 Carrying capacity refers to the number of individuals who can be supported in a given area within natural resource limits, and without degrading the natural social, cultural and economic environment for present and future generations. The carrying capacity for any given area is not fixed. It can be altered by improved technology, but mostly it is changed for the worse by pressures which accompany a population increase.
- 6 This is often referred to as market failure and implies that the allocation of goods and services by a free market is not efficient.
- 7 For example, raising taxes on the exportation of logs can encourage more value-added in the timber industry and less wasteful logging. Conversely, a subsidy on agro-chemicals can encourage their over-use, leading to greater localised freshwater and air pollution problems.
- 8 This is a good that is non-rivalled and non-excludable. This means, respectively, that consumption of the good by one individual does not reduce availability of the good for consumption by others; and that no one can be effectively excluded from using the good.
- 9 These are costs borne by some individuals which are entirely offset by gains accruing to other people, so that there are no net costs (or benefits) to society as a whole.
- 10 These are policy instruments that use price or other economic variables to provide incentives for polluters to reduce harmful emissions. They seek to address the market failure of negative environmental externalities either by incorporating the external cost of production or consumption activities through taxes or charges on processes or products, or by creating property rights and facilitating the establishment of a proxy market for the use of environmental services.
- 11 The government may also use product charges, a per unit tax on the offending generating product, to decrease the negative externality. Such a tax could be placed on agro-chemicals to decrease residual discharge from overuse of these chemicals.
- 12 This instrument effectively assigns a price to the subject causing the externality. There are numerous advantages to this type of policy. For firms, it allows those with low abatement costs to make pollution control investments and avoid the tax. This policy also motivates firms to advance their abatement technology in order to decrease the costs of abatement. As the tax leads to higher production costs for firms and subsequently higher prices for consumers, citizens may alter their consumption patterns to account for this price change.
- 13 The amount that individuals would have to be paid to make them as well off as they would be without the proposed tax change.