Economic Instruments for Promoting Sustainable Natural Resource Use, Environmental sustainability and Responses to Climate Change

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The untapped railway transport opportunity in Uganda
Photo Credit**:** Rose Hogan

Table of Contents

Figures

Tables

Boxes

Annexes

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FOREWORD

Policy instruments are termed economic instruments (EIs) for environmental management when their intended effect is to influence decision-making such that alternatives are chosen that lead to an environmentally more desirable situation. They are "economic" in that they affect the estimates of the costs and benefits of alternative actions or choices open to economic agents. The EIs that governments have used worldwide to influence good behaviour towards the environment have traditionally been fiscal instruments (taxes, subsidies, fees and charges) where they have direct control over the rate of tax, subsidy or charge as well as deciding how to spend any revenue raised.

This report is a summary of a study of the performance of six EIs that the Government has been using in terms of their returns to the Exchequer, benefits to target groups and their impacts on environmental management. The report was commissioned in order to inform the national development planning process as well as future budget processes by providing analysis and recommendations regarding the means to make EIs more effective in achieving pro-poor sustainable development.

This report is a welcome and timely contribution to the environmental sector, which is often hampered by limited data to support the legitimate case for increased investment in environmental management as a means to increased growth and reducing poverty.

The report presents the following recommendations to the Government for the next five-year development plan:

(i) Review the impact of current EIs with a view of addressing any limitations.
(ii) Introduce new EIs to take advantage of emerging opportunities and challenges.
(iii) Challenge and support the business sector to finance environmental management initiatives and programmes.
(iv) Build the capacities of ministries, local governments and other relevant institutions to supervise the implementation of EIs in their respective sectors.

If such actions are implemented, the Government will avoid missing out on the many environmental, poverty reduction and revenue benefits associated with EIs for environmental management. I therefore urge all central and local government agencies, civil society organizations, the private sector, communities, individuals and development partners to support the implementation of these priority actions.

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Acronyms and Abbreviations

BOD	Biological oxygen demand
BOU	Bank of Uganda
CAC	Command and control
COD	Chemical oxygen demand
EI	Economic instrument
EU	European Union
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Geenhouse gas
ITQ	Individual transferable quota
LPG	Liquefied petroleum gas
LRI	Lower respiratory infection
MBIFCT	Mgahinga and Bwindi Impenetrable Forest Conservation Trust
MDG	Millennium Development Goal
MFPED	Ministry of Finance Planning and Economic Development
NAADS	National Agricultural Advisory Services
NDP	National Development Plan
NEMA	National Environment Management Authority
NWSC	National Water and Sewerage Corporation
PEAP	Poverty Eradication Action Plan
PES	Payments for ecosystem services
REDD	Reduced Emissions from Deforestation and Forest Degradation
SGP	Small Grants Programme
SPGS	Sawlog Production Grant Scheme
TAC	Total allowable catch
UBOS	Uganda Bureau of Statistics
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNHS	Uganda National Household Survey
URA	Uganda Revenue Authority
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNHS	Uganda National Household Survey
URA	Uganda Revenue Authority
VAT	value-added tax
WB	World Bank
WRMRS	Water Resources Management Reform Strategy
WW	Waste water

Executive Summary

This report was prepared to inform the formulation of the five-year National Development Plan (NDP), whose theme is 'Growth, Employment and Prosperity'. It is based on a study that draws lessons learned from over a decade of using economic instruments (EIs) for environmental management for pro-poor growth. The study recommends improvements that the Government of Uganda could make in applying economic instruments. The Poverty–Environment Initiative of the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) funded the study and the preparation of this report.

The findings of the study, drawing on a review of six case studies from the energy, transport, water and sanitation, finance and banking sectors are revealing. EIs complement other instruments such as command and control (CAC) and regulation. This study has revealed that EIs were introduced for three broad objectives: enhancing environmental quality, improving the quality of human life, and raising public revenue. The Government has shown its commitment to the first two objectives by forfeiting revenue of approximately US$3.68 million that it would have raised on products such as solar equipment and liquefied petroleum gas (LPG). It is also losing revenue of between US$477,580 and US$856,612 annually due to weak enforcement of the pollution charge under the Water (Waste Discharge) Regulations 1998. Yet, such revenue would have gone a long way in helping the Directorate of Water Resources Management to deliver on its mandate. The Government has also shown its commitment to agriculture by exempting banks from tax on income earned from lending to agriculture.

In addition to this objective, it also uses EIs to improve the incomes and quality of life of the poor and to raise revenue. The three objectives, if well pursued, would certainly greatly contribute to the five-year National Development Plan (NDP), whose theme is *Growth, Employment and Prosperity*.

A review of six case studies from the sectors of energy, transport, water and sanitation, finance and banking has been revealing. The Government is forfeiting substantial revenue to pursue environmental objectives, which is indeed a reflection of its commitment to environmental management. It has not yet realized many positive environmental impacts, however, partly because it is still too early to see them for some EIs, and also because the legal and institutional capacities to monitor EIs is weak.

The Government cannot demonstrate substantial gains on the environmental front for three main reasons. First, it is still too early to see such impacts for some of environmental fiscal reforms that it introduced very recently, many after 2005. Second, institutional capacities to follow up the implementation are still weak. Finally, there is insufficient information consistently collected to measure and quantify the impacts. Another finding is that the impact of the EIs would have been greater had the Government invested sufficiently in preparatory studies that, in turn, would have recommended how to address some of these weaknesses. The Government should pilot catalytic initiatives aimed at ensuring that the poor actually benefit from the EIs as originally planned.

There is also evidence that the Government has raised substantial revenue (US$8.812 million), particularly through an environmental levy on environmental hazardous goods in the last two years only. With a recent increase of the same levy from 10 to 20 percent, the Government will be in position to raise more than US$13 million annually. If this revenue is well used, including for an increased allocation to the Environment and Natural Resources Sector, the current bottlenecks in implementing EIs for environmental management countrywide can be overcome. The Government

must, however, be cautioned against being overshadowed by the revenue-generation objective at the expense of the other two objectives. It must keep the three objectives in balance.

The Government's position to have a separate pillar on the environment and natural resources in the five-year NDP provides the opportunity for institutions in this sector to demonstrate innovative ways of building public-private partnerships for environmental management – using EIs is one of them. In addition, evidence from around the world also points to the conclusion that EIs are very powerful for improved environmental management because the market and price give signals for making appropriate allocations of resources.

Like other policy instruments, EIs should not unduly impose high administration costs, nor should they create more losers than winners. In some instances, benefits to the poor take a long time to be realized, such as payments for ecosystem services (PES), watershed restoration and substitution from biomass to LPG. In the interim, it would be profitable for the Government, with support from donors, to systematically invest in an environmental fiscal reform programme in a coordinated manner to address problems and tap new opportunities. It is strongly recommended that the Ministry of Finance, Planning and Economic Development, which has been at the centre stage of announcing the reviewed EIs, should take the lead in this reform programme. The return on investment would be extremely high.

Evidence from this study has shown that there is much scope to improve the implementation of EIs nationally. This is urgent since there are many EIs and their effectiveness has not been studied; also further untested EIs are proposed. As a general strategy to implementing the five-year NDP, the Government needs to: (i) review the impact of current EIs with a view to addressing any limitations; (ii) introduce new EIs to take advantage of emerging opportunities; (iii) challenge and support the business sector to finance environmental management; and (iv) build the capacities of ministries and institutions to supervise the implementation of EIs in their respective sectors. Unless this is done, the Government will miss out on the many environmental, poverty reduction and revenue benefits associated with EIs for environmental management.

PART I

National setting for promoting economic instruments for environmental management and growth

Part 1 provides an overview of the rationale for using economic instruments (EIs) for environmental management and economic growth. A summary of the EIs and their objectives is given.

The section also outlines the main ingredients that would give EI implementation a good chance for success and that should serve as a basis for their systematic monitoring.
The section thus sets the stage for the review and analysis of evidence from the implementation of six case studies in four sectors under the study.

1. Economic instruments for environmental management and growth

Background

Uganda is committed to harnessing its environmental resources as a core asset for sustainable development using a package of complementary policy instruments. These include Multi-lateral Environmental Agreements, legislation, standards, information, research, institutions and economic instruments (EIs). This commitment has been reflected by the government's inclusion of a developmental objective in the proposed five-year National Development Plan (NDP) stating: "to develop and optimally exploit the natural resource base and ensure environmental and economic sustainability". NDP's theme is *Growth, Employment and Prosperity*. It will also treat environment as a cross-cutting issue as has been the practice in the past.

This paper was commissioned by the statutory Environment and Natural Resources Sector Working Group as a contribution to the formulation of the above plan and was jointly funded by the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) Poverty-Environment Initiative.[1] The paper reviews the lessons learned from the implementation of EIs for environmental management in six case studies, two in the energy sector, two in the transport sector, one in the environment and water sector, and one in the banking and finance sector (Table 1).

The overall goal and objectives of the study

The overall goal of the study was to critically assess the extent to which the selected EIs listed in Table 1 have contributed to environmental management objectives and other objectives for which they were introduced and to examine the causes of the failure cases. The main objectives of the study were:

(a) to assess the adequacy of the policy, legal, institutional, political, socio-cultural and economic environment in which EIs are being implemented;
(b) to generate evidence on the successful and not so successful use of EIs in Uganda with special attention to environmental sustainability and poverty reduction;
(c) to propose changes that the Government should make in the case studies under implementation and to propose new EIs for adoption during the implementation of the five-year NDP.

[1] For details on this initiative, consult www.unpei.org.

Table 1: Classification of case studies by sector and objective

Sector	Case studies	Objective
A. Energy	1. Zero VAT on deep cycle batteries for solar energy 2. Zero VAT on Liquefied Petroleum Gas (LPG)	To **encourage** the adoption of solar equipment and accessories. To **encourage** alternative sources of lighting and cooking by increasing its affordability.
B. Transport	3. 10 percent environmental levy on vehicles 4. 10 percent environmental levy on motorcycles, bicycles and spare parts	To **discourage** environmentally hazardous goods (old vehicles and their spare parts). To **raise** government revenue.
C. Water and sanitation	5. Waste discharge fees	To **discourage** rampant pollution.
D. Finance and banking	6. Exemption of interest earned on loans to agriculture by banks	To **encourage** lending to agricultural sector.

Economic instruments and their rationale

Policy instruments are termed economic instruments (EIs) for environmental management to convey the message that their effect is to influence decision-making and behaviour in such a way that alternatives are chosen that lead to an environmentally more desirable situation than in their absence. They are "economic" in that they affect the estimates of the **costs** and **benefits** of alternative actions or choices open to economic agents[2]. The EIs that governments have used worldwide to influence behaviour towards the environment have traditionally been fiscal instruments (taxes, subsidies, fees and charges). In this case, governments have direct control over the rate of tax, subsidy or charge as well as deciding how to spend any revenue raised. The six case studies considered in Table 1 are all fiscal instruments.

As observed in Table 1, the Government wished to achieve one or more of the following objectives: (i) to improve environmental management; (ii) to improve the incomes and quality of living for the poor; and (iii) to raise government revenue (Table 2). Collectively, these three objectives contribute to poverty reduction and sustainable economic growth strategies of the Government. This paper analyses the extent to which these objectives have been met. Given that EIs are implemented in a dynamic socio-cultural, economic and political environment, they "should be regularly reviewed and adapted to ensure that they continue to be effective" (United Nations, 1992: p. 66), and hence the justification for the study that led to this report.

[2] An economic agent can be a firm or individual.

Table 2: The multiple benefits from EIs

Environmental benefits	Poverty reduction benefits	Fiscal benefits
• Sustainable management of resources	• Improve access to vital goods and services e.g. water, energy, credit, etc.	• Revenue generation
• Pollution control	• Freeing up financing to address environmental problems that hurt the poor	• Reduced distortions
• Conservation		• Reduced drain on public finance

EIs have been used for environmental management mainly because the market mechanism does not deal with many environmental problems. Markets may over-provide certain kinds of goods and services that exhibit negative external effects (e.g. pollution) while under-providing services that have external benefits (e.g. ecosystem services). The Government then intervenes by more effectively targeting the polluters – both producers and consumers of goods – so that they in turn absorb the costs that they are likely to impose on society (e.g. through negligence) in their production and consumption decisions. In this way, the polluters would stop treating the environment as a 'free good' and would no longer pass their pollution-related costs on to other segments of society or future generations. This is in line with **the polluter pays principle.**

Similarly, the Government uses EIs to reward firms and individuals that adopt sustainable environmental management practices that equally benefit the society (e.g watershed management, ecosystem conservation). To recognise their contribution, the Government compensates them on behalf of society for the extra effort they make to ensure other societal benefits, hence the principle: **beneficiary-pays-principle.** Thus, EIs can be offered to discourage undesirable practices, in which case they can be termed **disincentives** or to encourage the good ones, and hence termed **incentives**.

Table 1 presents three cases that are incentives and three that are disincentives. This paper refers to both categories as economic instruments (EIs). On the basis of the above rationale, the Uganda Government set as one of its environmental management policy objectives *"to ensure that individuals, groups, businesses and other economic entities have appropriate incentives and disincentives with regard to sustainable resource use and environmental protection"* (MNR,1994).

Finally, the rationale for using EIs is to lower the costs of meeting environmental targets compared to relying purely on Command and Control (CAC) regulation. Rather than forcing every firm to meet specific standards, EIs provide flexibility and in-built incentive to reward those adopting new technologies or other means of meeting standards at the lowest cost. There is empirical evidence from industrialised countries to back up the theory of lower costs of compliance using EIs (Barde and Smith, 1997).

An evaluation of EIs five years after the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil found that such instruments were "*among the most powerful policies for improved environmental management because the market and price give signals to make the appropriate allocation of resources*" (World Bank, 1997).

Globally, the importance of the internalization of environmental costs in sustainable development and the critical role of EIs in bringing it about was duly recognized by the UNCED in Rio de Janeiro in June 1992. Principle 16 of the Rio Declaration states: "*National Authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution with due regard to public interest and without distorting international trade and investment"* (United Nations, 1992).

The legal basis for using economic instruments in Uganda

The legal framework for using EIs for environmental management in Uganda became very prominent, after the National Environment Action Plan (NEAP) process, 1991–1995, whereby the resultant National Environment Act, 1995, among other legislation, provided for environmental EIs. The National Environment Act stated in Section 93:

> *"Notwithstanding the Income Tax Act, the Minister responsible for finance may, on the advice of the Board and the Policy Committee, include in the annual budget-*
>
> *(a) tax incentives to encourage good environmental behaviour, including the conservation of natural resources and the prevention or abatement of pollution;*
> *(b) user fees to ensure that those who use environmental resources pay the proper value for the utilisation of the resource; and*
> *(c) tax disincentives to deter bad environmental behaviour that leads to depletion of environmental resources or that causes pollution"*

However, the Minister responsible for finance is not necessarily the only one to announce the use of EIs: other ministers and heads of departments may do so on the basis of the legislation that they are mandated to implement and enforce. Overall, the use of EIs for environmental management in Uganda is not new; EIs have been applied in several sectors (Annex 1). However, it is the institutionalized systematic approach to their introduction, implementation, monitoring and evaluation that needs to be improved. This will be a critical area for reform and support by donors, because the Government has already highlighted the use of economic incentives and public-private partnerships as some of the strategies for the implementation of the five-year NDP; EIs are central to these strategies.

Methodology in reviewing the EIs

The authors used a combination of methods in preparing this report. They reviewed literature and documents on the EIs for environmental management in general and on the case studies in particular. They also sought information and data on the case studies particularly from the Uganda Revenue Authority (URA), the Directorate of Water Resources Management, Bank of Uganda and Ministry of Energy and Mineral Development. Strategic interviews were also conducted with individuals from the above institutions and players in the respective sectors. Comments and

contributions from the relevant stakeholders at two dissemination workshops have also enriched this report.

The authors analysed and presented evidence from the case studies from two perspectives, namely the '**before'** and '**after'** situation and the '**with**' and the '**without**' situation. To the extent possible, case studies from other parts of the world have been given to throw light on (i) the opportunities available to Uganda to improve the implementation of EIs and (ii) the conditions that should prevail if the EIs have to generate the desired impacts.

Structure of the report

This report is structured in three Parts. Part 1 focuses on the national setting for promoting EIs for environmental management and growth; Part 2 reviews the specific instruments, rationale and findings on the use of EIs in the selected sectors; and Part 3 concludes with a synthesis of the evidence from the case studies and presents a strong case to improve the implementation of EIs in their sectors and as an overarching strategy for the implementation of the five-year NDP.

Limitations of the study

The main limitation in this study is the fact that many of the EIs have been announced only in the recent past, after 2005; it may be too early, therefore, to see a pattern that can be attributed to their introduction. The information collection systems are not well-tailored to consistently monitor their impacts. Critically, no rigorous analysis was made on the likely effects on poor men and women before introducing EIs, and identifying measures to mitigate or compensate for any adverse effects. Accordingly, the emerging evidence has been used to highlight some of the impacts to monitor in future and the strategies to bring EIs back on course. Second, there is no structured approach to study the potential benefits of EIs in the various sectors in which they are implemented. Owing to this problem, the benchmarking for these instruments and the required indicators for their monitoring are still weak and sometimes non-existent.

2. Creating an enabling environment for the implementation of economic instruments

The complementarity of environmental policy instruments

In the previous chapter, the merits of using EIs for environmental management and economic growth have been described. It needs to be re-emphasized that EIs are not substitutes for other policy tools; rather they complement them. For example, one needs a legal framework to operationalize EIs, as has been shown in the previous chapter. Second, one can use a combination of legislation, standards, and EIs concurrently to address one environmental problem. In Uganda, EIs should be seen to complement many other environmental management tools like those in Box 1.

Box 1. Environment management tools that are complementary to EIs

- Environmental legislation
- Environmental standards
- Environmental regulations
- Environmental impact assessment
- Public awareness and participation
- Institutional reforms and strengthening
- Environmental audits
- Public information disclosure
- Environmental planning

Issues and conditions unsuited for economic instruments

Although EIs are attractive for environmental management, they have limitations. When dealing with situations of irreversibility and uncertainty, a safe minimum standard approach, and CAC instruments should be preferred, because they guarantee that the desired level of environmental quality is achieved. Consider, for instance, the case of dealing with toxic waste, which can have irreversible and disastrous health effects on the population: only a strict system of standard and enforcement will guarantee that waste disposal is carried out according to best available practices. In other situations, the consequence of some acts is not known: when there are reasons to believe that they might be negative, it makes sense, therefore, to use a command and control approach.

It has been stated in the previous chapter that governments are justified to intervene when the market either over-provides or under-provides environmental goods and services, i.e., when there is a market failure. Accordingly, EIs should not be introduced in situations that promote these market characteristics. For example, they should not be introduced where:

- there is a monopoly, oligopoly or monopsony because output is already restricted below the optimal level. The introduction of a tax could further reduce production and hurt the poor.

- demand for a product is generally inelastic. Increase in a tax, such as an environmental tax, would be passed on entirely to the consumer, and changes in quantities produced and sold (and associated pollution) would be minimal;

- there are too many small-scale and informal enterprises, which might be driven out of business by a pollution tax, or attracted in the market by a subsidy when enforcement is complex;

- the enterprises are owned by the Government and are receiving subsidies or soft budgets. They may have no incentive to invest in less polluting alternatives;

- there are no alternative technologies from which industries can choose to lower their pollution;

- implementing institutions are weak and/or corrupt.

Maintaining focus on the poor

Table 1 shows that the Government had a clear focus on the poor. The implication is that in practical terms, the poor should proportionately benefit more than the rich. In view of the five-year NDP's theme, the Government is going to be challenged not to lose the above focus. A critical consideration in that regard will be to ensure that the institutions and extension delivery mechanisms are responsive to the poor.

Institutional and political conditions for success of Economic Instruments

In practice, EIs are implemented together with command and control (CAC) systems. Both need a well-defined and stable regulatory framework, the political will to tackle powerful interest groups, institutional capacity within the Judiciary and Executive for monitoring and enforcement, and other necessary aspects of governance to achieve compliance with national policies.

As UNEP (2004: 23) states "….both types of policies require many of the same baseline conditions, the fundamental elements needed for functioning markets and governance in general. Without these governmental functions in place, environmental protection has a high likelihood of failure regardless of the specific instruments applied." While recognizing that many fundamental requirements for effective EIs and CAC are shared, we follow Barde (1994) in proposing a number of key conditions for the application of EIs to Uganda, as set out below.

Correcting price distortions

Barde (1994) and United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) (2008) clearly indicate that a developing country concerned with strengthening their EIs for environmental management should first remove price distortions. UNESCAP suggest an additional high priority action of identifying and removing environmentally damaging taxes or exemptions, i.e. those that have significant negative environmental impacts.

Low energy and irrigation water prices are identified as a particular problem, resulting in the waste of water resources, soil saturation and salinization.[3] Bose, Shukla, Srinivasta and Yaron (2005) describe the situation in which politicians from all parties promised "cheap power for poor farmers" and effectively forced the electricity utility in Karnataka, India to keep agricultural tariffs at well below cost-recovery rates. As a consequence the utility had to ration the supply to farmers, forcing them to purchase diesel pumps that could only be fully used by large-scale farmers. Hence, the cost per unit of energy delivered ended up being much higher for poorer than richer farmers. The main message here is that it pays to study the likely effects, both positive and negative, that may emerge in different sectors from the introduction of EIs and to plan how to mitigate against the negative ones.

[3] Repetto (1986), in a World Bank study of 149 irrigation projects across Indonesia, South Korea, Nepal, Philippines, Thailand and Bangladesh found that the price charged for water covered less than 7 percent of its supply cost without even taking into account environmental costs.

Macro-economic stability and information flow

Macroeconomic stability, in particular, low or moderate inflation is important for EIs. Where inflation is high, for example, an agreed annual payment to a local community for managing a watershed would soon become much less valuable and cease to compensate people for their time in managing the area. O'Connor (1996) identifies the effect of inflation eroding the real value of pollution charges in China as one reason for which these instruments have failed to tackle pollution.

O'Connor (1996) argues that a key advantage of EIs over CACs is the former's informational parsimony. While this is true, information flows are essential for monitoring the effect of all EIs. In addition, some EIs require more information than others to function. For instance, carbon markets rely on prices that can change by the minute, while a timber concession auction requires price and technical information prior and during the auction. This information has to be credible for the EIs to work. In timber concession auctions, companies will not bid their true valuation or may not bid at all if they do not trust the information available.

Appropriate institutional structures and capacity

Barde (1994) identifies well-defined and enforced property rights as a critical condition for EIs arguing that they must be "exclusive, transferable and safe". It is certainly the case that open access resources – where clear and enforceable property rights do not exist – are particularly vulnerable to degradation.

Kerr, Pender and Suyanto (2006) quoted in Richards (2007) report the case of an Indonesian community forestry programme in which farmers have been granted use of degraded state forest for establishing shade-based coffee, provided that they protect the rest of the forest. This has resulted in tenure benefits to the farmers and circumvents their financing problem. In Uganda, firms and individuals have increased commercial forestry after having secured two incentives, namely, permits to land in central forest reserves and subsidies under the EU-funded Sawlog Production Grant Scheme (SPGS). As a result, over 10,000 ha have been planted in the last five years as compensatory for biodiversity conservation (Kazoora, 2007).

Another important institutional structure, particularly for businesses, is a well-defined and stable regulatory framework. This should not become complex since it would simply increase the costs of using EIs and create conditions for avoidance and sometimes rent-seeking. As the experience of the Cameroonian forestry sector shows, it can take many years – even with significant donor support – to overcome entrenched interests and build sufficient national capacity to *implement* a well-drafted forestry law that devolves management responsibilities to local communities, enabling the use of EIs (Jum *et al*., 2007: 625–641).

EIs are usually thought to make fewer demands on the institutional capacity of developing countries than CAC – or at least to place relatively more demands on ministries of finance that are better resourced than environment ministries or agencies (O'Connor, 1996: 20). This should be looked at selectively. For example, the 2007 United Nations Framework Convention on Climate Change (UNFCCC) decision in Bali, Indonesia, in favour of Reduced Emissions from Deforestation and Forest Degradation (REDD) from 2013 requires potential beneficiaries from developing countries to have the capacity to participate in whichever trading system emerges. Similarly, if the implementation of an EI would best be achieved through decentralization, then it would call for

building capacities of the concerned structures. A strong central coordination mechanism would be needed.

Earmarking funds from EIs can be a way of building institutional capacity of environmental agencies and can incentivize collection by local and regional governments or governmental agencies. In the case of private sector firms, they may also need accessible financing. This has been one of the barriers to companies in Uganda to adopt less polluting technologies. Just as the Government has given incentives to financial institutions to lend to agriculture, it should equally consider some incentives for industries.

Technical constraints

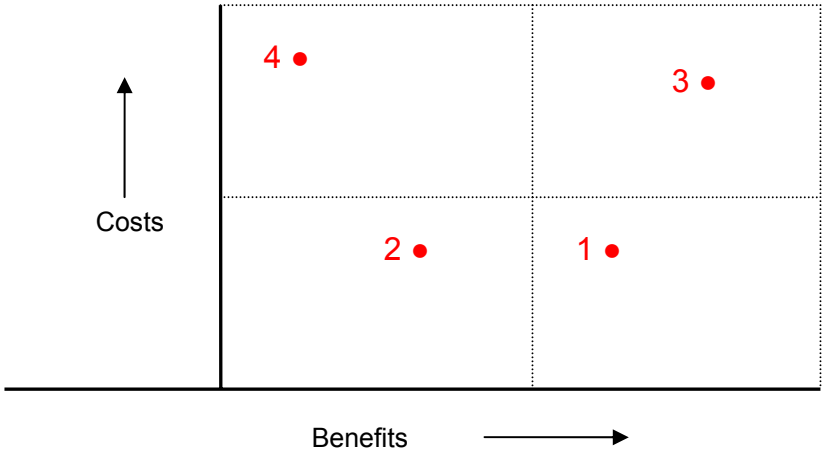
O'Connor (1996) notes that the selected EIs need to be well-tailored to the characteristics of the pollution problem; their introduction should be based on solid and complete data. The author highlights: (i) technical factors such as the nature of the pollutant (whether acutely toxic, bio-accumulative, carcinogenic, etc.) and of the dose-response function (whether linear, exponential, subject to threshold effects, etc.); and (ii) the demographic characteristics of pollution sources (a few large or many small sources; geographically concentrated or dispersed sources; stationary or mobile sources.

Even in circumstances where information on the above is forthcoming, during implementation, some individuals may be negatively impacted socially, economically and environmentally on a temporary basis. It is advisable to introduce mitigation measures (sometimes known as "flanking" measures) together with EIs as a necessary strategy in overcoming political opposition to new EIs and protecting the poor.

Benefit-cost analysis of economic instruments

It is imperative that the introduction of EIs is tested for their likely effectiveness and efficiency during their implementation. Four scenarios are depicted in Figure 1. Example 1 could describe a situation where the Government enhances the returns or benefits by correcting a market failure that currently produces perverse incentives for environmental management. For instance, when the then Forest Department (now the National Forest Authority, NFA) was using administratively set timber royalties, its concessionaires were not motivated towards efficient timber recovery. In addition, the Department was losing much revenue. When NFA introduced a competitive bidding system, both timber recovery and revenue greatly improved. The time was favourable for introducing the new bidding system due to the flexibility it was given to operate semi-autonomously – including being challenged to be financially sustainable under the National Forestry and Tree Planting Act, 2004.

Figure 1: National costs and benefits of economic instrument options



Source: Yaron, 2008

There are still some costs associated with Example 1 in the Figure above. First, there are political costs involved in obtaining support from the Ministry of Finance to promote this change and overcome objections from the affected lobby. Second, some groups will lose out, and some of the financial savings may be needed to train them to present acceptable bids. This is what occurred in the forestry sector in Uganda in 2004, as described above.

Option 2 illustrates a relatively low cost/low benefit policy. Many EIs that are limited to one sector or parts of the country fit into this category. Examples relevant to Uganda include payments for watershed management, voluntary initiatives by particular industries and incentives to reduce plastic bag disposal. While the national returns from these EIs may be relatively modest, they can nevertheless make a big difference in particular areas and can typically be realized quickly, within the life of one government administration.

Option 3 illustrates a relatively high cost/high benefit policy scenario with national level benefits, but requiring significant investment. A national scheme for REDD under the post-Kyoto system is likely to fall under this category. There is certainly much at stake. Stern (2006) estimates that globally, 1.6 $GtCO_2$ each year could be saved by spending less than US\$10/tCO_2 This is one of the cheapest sequestration options available and translates into an annual global spending of US\$5–15 billion, most of which would have to be spent in tropical Africa and Latin America.[4] Readiness to participate in this system implies being able to guarantee additionality, permanence and no leakage (Commonwealth Secretariat, 2008). This requires a significant investment over the next five years. As Spracklen *et al.* (2008) note, in order for developing countries to achieve this status, they must improve land tenure for agro-forestry and property rights for forest-dependent communities, strengthen governance, increase local information on the opportunities for REDD, reduce transaction costs for local project developers, and build the necessary technical and institutional capacity to support project development. In the Ugandan context, building institutional capacity within the Government means improving the knowledge and skills of the Designated National

[4] Enkvist, Nauclér and Rosander (2007) argue that 50 percent of deforestation in Africa and 75 percent in Latin America could be avoided at €40/tCO_2, but the costs in Asia would be much higher

Authority (DNA) for Climate Change. However, the Government should leave implementation to the private sector.

Option 4 gives an illustration of EIs that produce low benefits relative to their cost. They are unlikely to reflect intrinsic problems with the EI, but rather with the way in which the policy has been introduced. In the case of fisheries, individual transferable quotas (ITQs) give the holder a right to catch a specified proportion of the total allowable catch (TAC) each year. A study carried out by the Organisation for Economic Co-operation and Development (OECD) of 31 fisheries in six countries, reported by UNEP (2004), found that this system produced economic and environmental gains, but problems with ITQs in Chile and South Africa suggest that ITQs may be costly for many developing countries. In Chile, there are "significant concerns that TAC figures are not as precise as they need to be" (UNEP, 2004). In South Africa, the problem has been political pressure to increase the TAC regardless of the environmental implications. It should be noted that powerful political lobbying also results in high cost/low benefit EI outcomes in developed countries.[5] However, UNEP (2004) notes the particular risk that "where institutions are weak or corruption rife, limits can be manipulated for private gain."

In sum, there are many factors that favour the implementation of EIs, including enabling legislation, institutions, adequate information, political will, macro-economic stability and capacity to enforce. These factors can and do change because of national, regional and global dynamics. They must therefore be a subject of continuous study. For a country like Uganda with low capacities, a high illiteracy rate, weak information-gathering systems and a dominance of small and medium enterprises, the implementation of EIs for pro-poor growth requires a well-coordinated and -supported programme.

[5] In the United Kingdom, for example, electricity generators were given emission allowances for free under Phase 1 of the EU Emissions Trading Scheme, creating windfall profits and limited environmental gains.

PART II

Economic instruments for environmental management and growth in practice: the emerging lessons, opportunities and challenges

Part II reviews the findings from the implementation of economic instruments (EIs) in Uganda in the sectors of energy, transport, water and sanitation, and finance and banking. As a standard, each case study on these sectors looks at the EI that the government announced, its rationale, the findings, conclusions and the way forward. Evidence from the case studies is combined with that from other countries to highlight both the opportunities and challenges in using EIs.

3. Economic instruments for the energy sector

Tax exemption on solar equipment and liquefied petroleum gas

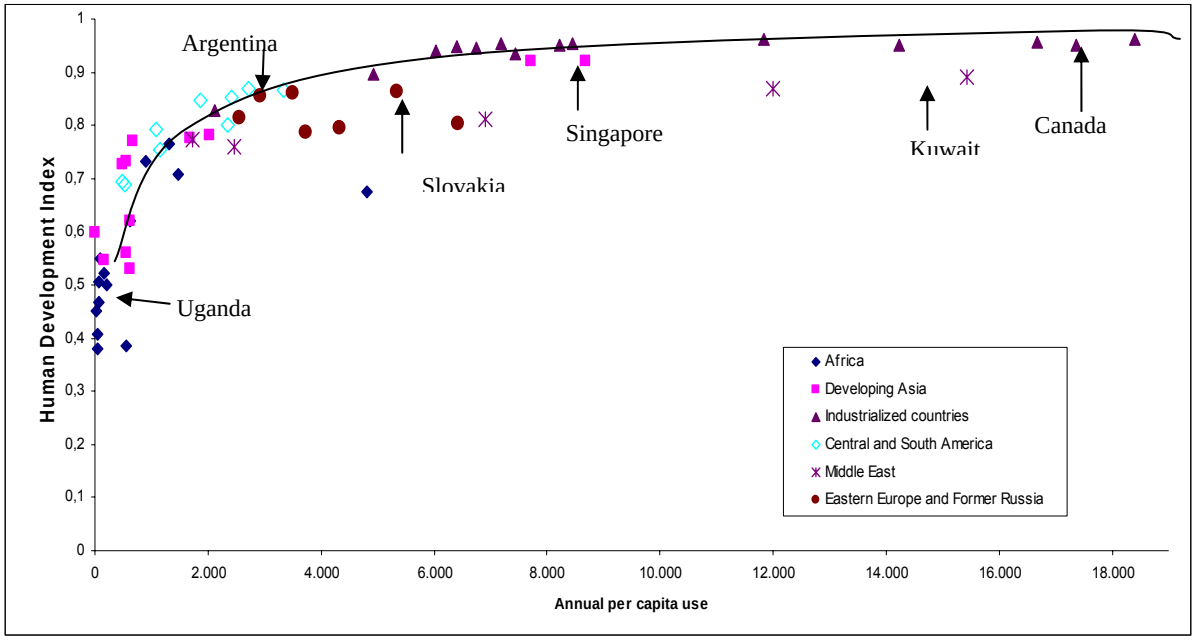
Two major economic reforms under the energy sector, which are a subject of this report, were solar energy in 2005 and LPG in 2006. In June 2005, the Government announced that "in recognition of the need to develop alternative source of energy as part of the efforts to modernise our society, solar equipment and parts do not attract duty in the Common External Tariff (CET). In this regard, duty on deep cycle batteries has been remitted to 0 percent" (MFPED, 2005). In addition, the Government also promised that it would continue to explore the opportunity for the use of solar-powered pumps for irrigation as part of its programme to provide relief for the most water-stressed areas by implementing low-cost rain water harvesting technology and provision of bulk water supply from large water masses" (ibid: 24).

During the Government's Budget Speech in 2006, it further proposed to "exempt value added tax on liquefied petroleum gas (LPG) to increase its affordability given its use as an alternative source for lighting and cooking"(MFPED, 2006)

Rationale

One of the key benefits that Uganda would derive from encouraging the poor to adopt solar energy and LPG is the contribution to their human development. The strong relationship between access to modern energy and human development, and attainment of Millennium Development Goals (MDGs) is shown in Figure 2. Uganda, like other African countries represented in the figure, is still lagging behind in its access to modern energy. The *Uganda Human Development Report* 2005 asserted: "no energy, no MDGs" (p. 71).

Figure 2: The link between energy use and human development

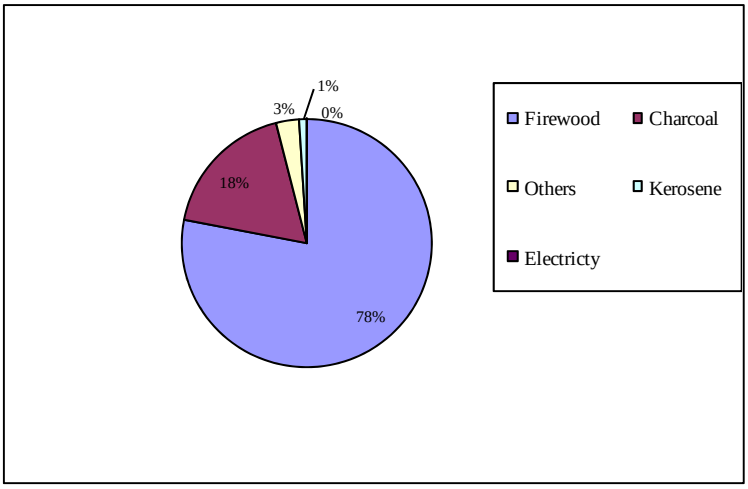


Source: Based on statistics from Global Human Development Report, 2008

Further, Figure 3 reveals that, in 2005–2006, 78 percent of households depended on firewood and 18 percent depended on charcoal for cooking. A small proportion of households, less than 1 percent, used electricity for cooking. Charcoal was mainly used in urban areas (66 percent), while firewood was more prominent in rural areas (89 percent). Overall, 96 percent of the households depended on wood fuel for cooking. The Government considers continued dependency on biomass for energy as a challenge to achieving the MDG targets and promoting environmental sustainability (UBOS, 2007).

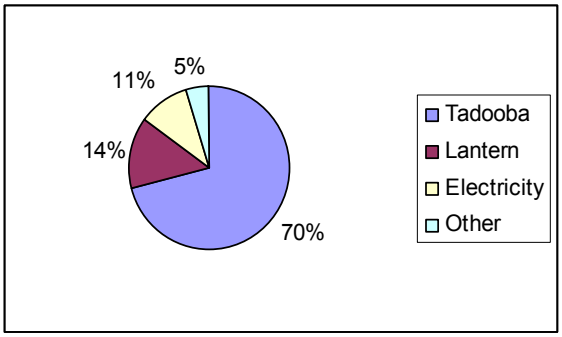
In addition, most households (70 percent) used *tadooba*, a locally made simple paraffin candle, for lighting purposes, which contributes to indoor pollution through smoke and soot emissions, while 14 percent used kerosene lanterns (Figure 4). Only 11 percent of households used electricity as the main source of lighting (UBOS, 2007). The proportion of households using electricity in rural areas was very small, at only 4 percent.

Figure 3: Sources of energy for cooking



Source: UNHS, 2005/06

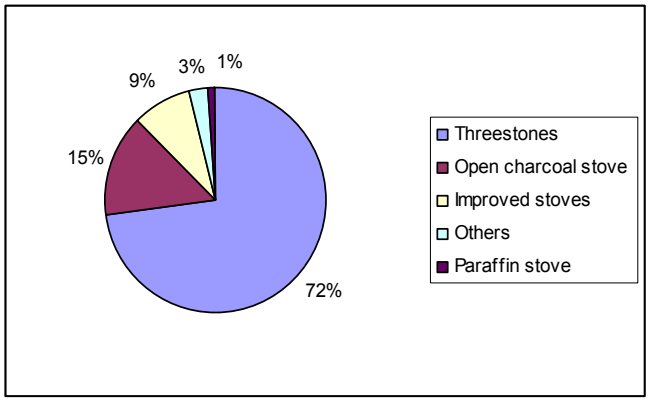
Figure 4: Sources of energy for light



Source: UNHS, 2005/06

The survey results also revealed that the most widely used cooking technologies were the traditional three stones, at 72 percent, and the **sigiri** (traditional metal charcoal stove) at 15 percent; only 9 percent of all households used improved charcoal and firewood stoves. It should be noted that only 2.8 percent of the households used electric plates and gas stoves. Only 0.3 percent of households depended on LGP for cooking (Figure 5). The Government hopes that substitution of LPG for wood fuel will reduce deforestation.

Figure 5: Distribution of type of cooking technology



Source: UNHS, 2005/06

The rationale to substitute more polluting fuels with less polluting ones is to save health and related costs. On the basis of a review of 15 studies, the average risk of lower respiratory infection (LRI) in children under five years of age exposed to indoor air pollution from solid fuel use was estimated at 2.3; i.e. children exposed to indoor air pollution from household solid-fuel use have around 2.3 times higher risk of LRIs (Smith *et al.*, 2004). Further, the same study also established that, overall, women over 20 years old exposed to indoor air pollution from solid-fuel use have around 3.2 times higher risk of chronic obstructive pulmonary disease (COPD). These two health outcomes, LRI and COPD, are responsible for almost all the 1.6 million deaths attributed to indoor air pollution each year (Ibid).

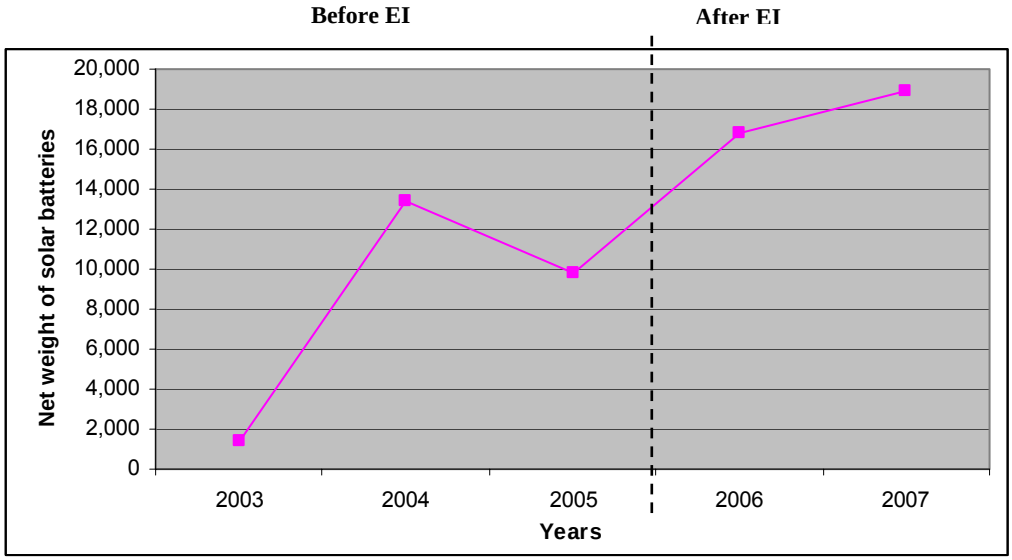
In Uganda, acute respiratory infection (ARI) is the second highest cause of death in children under five. Twenty-one percent of all under-five deaths in the country are due to respiratory infection. Both the Government and households could save in public expenditure on health and medical bills, respectively. Studies in India have shown that a shift from crop residue to LPG for one household would decrease indoor air pollution by 95 percent and GHG emissions by 75 percent (Smith *et al.*, 2000a and 2000b).

Findings

The net weight of deep cycle batteries imported for solar energy has increased after the removal of tax with respect to the situation before (Figure 6). Second, by the Government remitting duty to 0 percent on deep cycle batteries in 2005, it forfeited U Sh911 million in 2005/06, and U Sh1.777 million in 2006/07. The total for both years was approximately $1.58 million. Third, there are about 15 companies leading the market in the importation of solar batteries and solar

panels in the country, all of which have their main offices in Kampala; a few operate franchises in other parts of the country.

Figure 6: Trends in the importation of deep cycle batteries for solar energy, 2003–2007



Source: Uganda Revenue Authority

The importation of LPGs has been dominated by petroleum companies, especially Shell, Total, Caltex and Kobil. The implication is that for the Government to succeed in popularizing LPGs, it needs to strike a deal with these companies. In the first year of implementation, the Government forfeited revenue worth U Sh3.4 billion, equivalent to US$2.1 million. This was its investment. It was found to be too early to establish the access of LPG by the poor, since retail outlets have not expanded beyond urban areas. The retail prices for LPG have not come down after the removal of the value-added tax (VAT). It is highly likely that it is the importing companies that have benefited from the removal of VAT.

Another observation is that the Government did not assess how the benefits of accessing energy services would actually be distributed among different income brackets. Central to this assessment would be to identify whether the poor could afford LPG.

At an estimated U Sh13,000 (US$7.40) expenditure on energy by the poor, U Sh 10,000 (US$5.70) by the very poor and U Sh5,500 (US$3.10) by the extremely poor, Kyokutamba (2007) argued that LPG was “too costly for poor households to use either exclusively or even with other energy forms”. At the time, the initial cost of the smallest LGP cylinder of 6 kg was U Sh 40,000 (US$24) and U Sh22,000 (US$13) for the recurrent cost of refilling. The main lesson, therefore, is that the tax exemption alone was not bound to stimulate demand from the poor.

In conclusion, inasmuch as the Government had a good case to introduce the EIs for solar energy and LPG, it would have been a highly worthwhile investment to study the market characteristics of solar energy and LPG with the view of protecting the environment and improving the quality of life of the poor. Unless this is done, the Government may be losing out by forfeiting substantial

revenue. Uganda can draw on lessons learned in Barbados. Before the latter embarked on a programme to popularize solar energy country-wide, it commissioned a benefit cost analysis study (Husbands, 1970). The study, which was carried out in the 1970s, found that tax incentives for solar energy could save the island an estimated US$50 million in energy costs in less than two decades, at a cost for the Government of US$6.6 million in tax revenues. The potential gains were enormous enough to persuade the Government to borrow in order to fund the solar programme.

Many barriers still remain to poor people accessing solar energy and LPGs, many of which were highlighted by, the Minister of Energy and Mineral Development in 2003. Top on the list were: (i) the high cost of investment in renewable energy technologies (RETs); (ii) low incomes of the poor, especially in the rural areas; (iii) high upfront connection costs; (iv) implementation reforms in the energy sector that tended to benefit the rich rather than the poor; (v) inadequate technical and business capacity in RETs; (vi) poor infrastructure for distribution; and (vii) inadequate financing mechanisms to encourage private investments and for providing credit facilities, among others (Hon Syda Bbumba, 2007). The renewable energy policy also mentions lack of awareness and various socio-economic barriers (MEMD, 2002: 23).

The most challenging aspect of popularizing solar energy and LPG is that the market for these products is fully liberalized. Institutionally, aspects related to the energy extension service were not decentralized to local governments. The challenges of offering EIs for the poor in a fully liberalized market are described in Box 2.

Despite the challenges, evidence from Senegal strongly suggests that popularization of LPG can reduce deforestation and improve the quality of life for the poor. Senegal started an LPG programme in the 1970s, at a time when wood fuel consumption accounted for 90 percent of energy needs. Its situation then was therefore similar to that of Uganda today. Dependency on wood fuel was detrimental to the country's natural forest and a burden to women who spent much of their time collecting firewood. The programme started in 1974 with the introduction of a 2.75 kg only capacity gas bottles, on which all import duties had been removed on the bottle and cooker. But the gas was not subsidized. In 1976, the Senegalese Government decided to subsidize the 2.75 kg gas cylinders but withdraw tax exemption on imported equipment.

Box 2: Opportunities and challenges for popularizing solar energy in a liberalized market

Ugandans use solar energy every day: for drying sorghum for local brews, maize for food, fruit and cocoa for export, and of course, for laundry. However, less than 1 percent of Ugandans actually use solar technology for electricity. What prevents them from taking full advantage of their equatorial rays?

Fake or low quality panels hawked on the street do not live up to expectations and give solar a bad reputation, while high transportation costs and marketing challenges prevent solar energy from reaching a large rural market. Inspection requirements increase costs for well-established solar companies that are likely to import quality panels, while small vendors continue to hawk unlabelled, unaccredited panels at lower prices.

But what about the 97 percent of rural Ugandans who do not even have access to electricity? Transportation costs for fragile solar equipment make it hard to offer the poor an affordable option.

"Rural people who struggle to pay a U Sh20,000 school fee certainly cannot afford to pay U Sh190,000 up front for a solar lantern," says Mr. Martin Kayongo, Leasing Manager at Uganda Microfinance Ltd. (UML), who facilitates rural access to solar products through loans and leases. Microfinance loans or leases offer families an option to pay for the product over a period of up to two years.

"Many rural families already spend around U Sh180,000 for one year's electricity needs," says Mr. Nandedkar, "It's just spread out over 12 months." Assume a family uses six litres of kerosene per month; at U Sh1,700 per litre; this adds up to U Sh122,400 annually. Add two phone charges per week at U Sh600 each, for an annual total of U Sh57,600; thus the family spends U Sh180,000 for one year's light and electricity costs. Add to this the cost of matches, lamp glasses and transportation required to reach phone-charging kiosks. For the same price, a family could have paid for a solar lantern through a loan from Uganda Microfinance Limited (UML), saving U Sh120,000 per year in electricity costs thereafter.

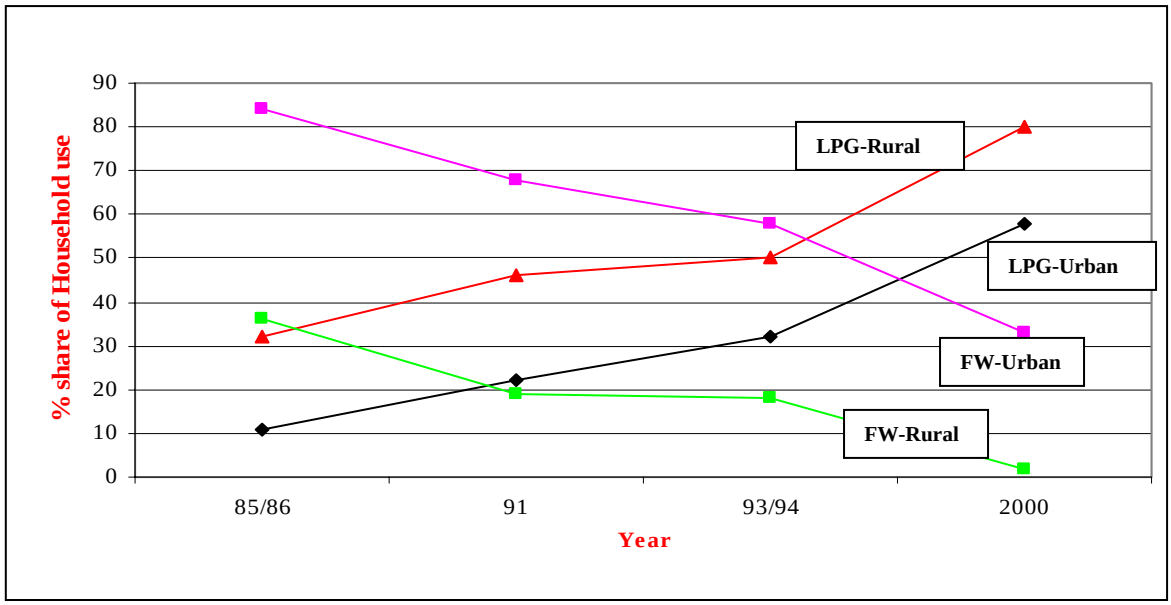
Source: The Daily Monitor Newspaper, 24 July 2007.

In 1983, in response to the needs of large families, a bigger cooker model, the Nopale was introduced in Senegal, adapted to fit a 6 kg capacity cylinder. By the time the Government liberalised the LPG market in 1998 and took steps to phase out subsidies, LPG had penetrated households of the poor and rich families. By 1994, subsidies had risen to US$10 million (World Bank Rural Energy and Development Report 1996.

Although using subsidies in Uganda now is disputable, there are some lessons to be drawn here with respect the environment. Deliveries of wood fuel in Dakar visibly declined as LPG deliveries rose. According to estimates from the Ministry of Energy, the growth in LPG use resulted in annual savings of about 70,000 tonnes of wood fuel and 90,000 tonnes of charcoal.

Similarly, LPG displaced firewood in rural and urban Botswana (Figure 7). It should be pointed out, however, that it takes time to observe the positive impacts on the environment. Such long gestation periods have disadvantaged the environment in general, as Ministries of Finance prioritize sectors that promise quick gains. The main lesson learned is that Uganda should not expect short-term gains. It needs to draw from the valuable lessons in countries described above to remain consistent in its policy for increasing access to modern energy by the poor.

Figure 7: Liquefied petroleum gas displacing firewood in urban and rural Botswana



Source: Davidson, 2007

Conclusion and way forward

The Government's rationale and financial commitment to improving poor people's access to cheap and/or renewable energy is still valid on environmental, economic and social grounds. Experience from Barbados, Senegal, Botswana and India have demonstrated that EIs have at least delivered environmental, economic and health impacts. In all of these countries, the positive impacts took a very long time to be realized. Uganda should not expect the story to be any different, particularly since it introduced EIs at a time when the access to modern energy to the poor was very low and poverty levels still high.

As a strategy, it is recommended that the Government invests in further information gathering, particularly on establishing the possibility of overcoming social, cultural, economic and environmental barriers to popularizing access to modern energy by the poor. Practical business linkages between the multi-nationals that import LPG and solar energy, and small rural enterprises need to be established and supported. Consumer awareness of quality standards of energy products and services needs to be raised by the Ministry of Energy and Mineral Development. It would be worthwhile for the Government to pilot catalytic initiatives to reach the poor through micro-finance institutions (MFIs), savings and credit cooperative organizations (SACCOs), civil society organizations (CSOs), commercial banks and public-private partnerships. Through such a multi-institutional strategy, it would be able, first, to improve competition for delivery to the poor and second, to draw lessons to improve the targeting of the incentives. Here, donors can play a fundamental role in funding an environmental fiscal reform programme in the energy sector.

4. Economic instruments for the transport sector

Environmental levy on motor vehicles and spare parts

In 2004, the Government announced that it would take measures to minimize the importation of used goods. Two years later, it announced a 10 percent environmental levy on motor vehicles (excluding goods vehicles) of eight years old and over in order to discourage environmentally hazardous used goods. Other goods subjected to the same levy at different rates were fridges, television sets, cookers, radios and second-hand household appliances. In addition to this objective, the Government set another one – to raise U Sh4.6 billion as revenue. In 2007, the Government went a step further and introduced a 10 percent environmental levy on vehicle parts, used motorcycles and bicycles, all critical constituents of the transport sector.

Rationale

As stated above, the Government aimed at reducing importation of 'environmentally hazardous goods' and to raise revenue. Vehicles are a primary source of harmful pollutants, such as oxides of nitrogen, sulphur, particulate matter, lead, carbon monoxide and volatile organic compounds, which cause a variety of health problems. Old vehicles increase the chances of accidents as well as requiring high operating costs. Uganda has one of the highest accident rates in Africa, at 160 fatalities per 10,000 vehicles. In 2001, it was found that nice out of ten new registrations were used vehicles and there was no age limit on vehicle imports (Benmaamar, 2001). The average age of mini-buses was 13 years. In 2001, road accidents cost the Ugandan economy US$101 million per year,[6] representing 2.3 percent of the country's GDP (ibid: 2).

According to the Uganda's energy policy (MEMD, 2002), gaseous emissions from vehicles constitute a significant portion of pollutants in towns and 75 percent of greenhouse gas (GHG) emissions, (Kampala Traffic Flow Improvement Project, 2002). Further, the policy set out the strategy to formulate fiscal and transport policies in order to promote energy conservation and efficiency; encourage implementation of more efficient vehicles; and give incentives to promote mass transport systems in order to reduce the proliferation of individual vehicles, among others.

The total number of cars in circulation in the economy has grown, from a mere 35,000 vehicles in 1990 to over 300,000 by 2006. In urban Kampala, where most of the vehicles are found, problems of traffic jams are common. The railway, which offered passenger and cargo transport to western and northern Uganda, ceased operations in the early 1980s. Efforts by the Governments of Uganda and Kenya to revitalize the railway system, which starts from Mombasa Harbour, are still faced with procurement problems. This implies that vehicles will continue to dominate the transport system, both in the country and the region.

Findings

Second-hand vehicles over eight years old continue to be imported in the country. The government earned a great deal of revenue, U Sh3.7 billion in 2006, and U Sh10.5 billion in 2007. The 2007

[6] This was based on an average cost per vehicle damaged of US$2,290, an average fatality cost of US$8,600 and injury costs of US$1,933.

revenue far exceeds the target of U Sh4.6 billion that had been anticipated. In two years alone, an equivalent of US$8.6 million has been earned through the environmental levy on old vehicles (Table 3)

Further, the environmental levy has not yet caused a fundamental shift in the age mix of imported vehicles for two main reasons: the cost of old vehicles are a mere one-fifth that of the new vehicles, hence a 10 percent levy is not a factor in the decisions of importers, and consumers have not yet commanded such purchasing power to shift to newer vehicles. Although banks are providing hire-purchase loans to their customers importing cars of seven years and under, very few customers are positioned to qualify because they do not earn a regular income.

The exporters of vehicles in Japan and Dubai in particular have found such a large market in Uganda that some have even established sales outlets in Kampala. The Internet has also enabled potential buyers to make business transactions directly with dealers in exporting countries. For example, one website advertises that there is no age limit of vehicles that can be imported to Uganda. Uganda also does not require any pre-shipment inspection of used vehicles."[7] It should be noted that southern Sudanese citizens also purchase vehicles in Uganda, which implies that the problem of reducing the number of old vehicles must be interpreted within a wider market context for such vehicles in the region.

Table 3: Changes in user registration of vehicles and related environmental levy, 2003–2007

Type of Vehicle	2003	2004	2005	2006	2007
Quantity	**Before EI**			**After EI**	
1.Tractors	167	336	352	518	340
2.Passenger vehicles[a]	2,725	3,283	2,886	1,956	2,731
3.Personal cars	8,843	9,930	13,987	14,383	17,112
4.Commercial vehicles[b]	5,922	6,063	5,805	5,677	6,928
5.Special-purpose vehicles	51	85	90	102	81
Total	**17,708**	**19,697**	**23,120**	**22,636**	**27,192**
Environmental levy (U Sh '000,000)					
1.Tractors	0	0	0	0	0
2.Passenger vehicles[8]	0	0	0	455	1,640
3.Personal cars	0	0	0	3,246	8,509
4.Commercial vehicles[9]	0	0	0	0	437
5.Special purpose vehicles	0	0	0	0	0
Total	**0**	**0**	**0**	**3,701**	**10,586**

Source: Uganda Revenue Authority
Note: a. carrying more than ten people
b. for transport of goods

[7] See http//:www.used-car-japan.com/importing-japanese-used-cars-to-Uganda.php
[8] See footnote 18
[9] See footnote 20

Furthermore, unlike in the past, the importation of vehicles is no longer restricted in terms of road mileage. In 2007, the Government abolished road licence fees, which implies that the Traffic Inspection Department that vetoed vehicles for their road-worthiness before annual renewal of licences became redundant. Under these circumstances, there are no administrative procedures to verify the age of the vehicle; everything is left to the forces of demand and supply in a liberalized market.

Enthusiastic about the revenue potential of environmental levy, the Government has increased it to 20 percent in the 2008/09 budget, with the potential to generate more than U Sh 21 billion, or US$13 million. The government should avoid being overshadowed by the revenue motive at the expense of the environmental one. It needs to use some of the revenue raised to support mutually re-enforcing CAC institutions such as the Traffic Inspection Department, the Uganda Bureau of Standards and the Uganda Revenue Authority.

Uganda needs to learn from experiences of other countries to control vehicle-related pollution. In a move to improve air quality, Sri Lanka has made a vehicle gas emission test compulsory in effect from July 2008. This is also likely to raise substantial revenue for the Government since vehicles will pay between 500 and 1,000 rupees (US$4.6–9.2) for such testing as a procedure for renewing licences. South Africa has also adopted the emission (smoke) test.

Furthermore, the Government has raised modest revenue on motor spare parts, motorcycles and bicycles. As of April 2008, the cumulative revenue since the introduction of environmental levy on these commodities in June 2007 stood at U Sh149 million, U Sh185 million and U Sh16 million, respectively. This translates into a total of U Sh350 million, or US$212,000. As in the case of vehicles, it is still too early to witness a shift in the age composition of these commodities.

It must be mentioned that Uganda does not feature among the high polluting countries on the basis of car emissions to the atmosphere and negative consequences for climate change. Nonetheless, as a signatory to the UNFCCC, it is commendable that it is making a contribution to mitigating climate change. It has also been part of the Government's strategy to reduce the number of individual private cars as an incentive for the use of buses, particularly in Kampala, in order to address congestion and related loss of productivity due to traffic jams. After one year, evidence shows that buses are not yet a substantial proportion of imported vehicles, despite the fact that they are exempt from the environmental levy (Table 4). On the contrary, minibuses have shown the largest percentage growth over the entire period, reflecting their attractiveness on factors of affordability and convenience to the passengers.

Table 4: No. of new registrations of vehicles by type, 2002–2006

Vehicle Type	2002	2003	2004	2005	2006
	Before EI				After EI
Cars	5,146	6,456	6,918	9,870	9,764
Trucks	2,105	1,189	1,214	2,030	2,747
Pick ups & 4-Wheel drives	3,734	6,239	6,554	4,206	3,658
Minibuses	2,213	2,980	3,219	6,583	6,367
Buses	84	52	64	78	76
Tractors	94	245	264	272	197
Motorcycles	12,159	15,982	17,131	27,916	36,599
Others	114	148	174	152	209
Total	**25,649**	**33,291**	**35,538**	**51,107**	**59,617**

Source: Ministry of Works, Housing and Communications, 2008

The implication from the above findings is that there is cause for the Government to study the entire spectrum of factors that dictate choice of mode of transport by individuals. It would accordingly address many more aspects of transport than under the current circumstances, including those that support the poor. In the short run, it should identify and implement complementary CAC interventions that support the effectiveness of EIs in the sector.

From environmental considerations, and which was the Government's main objective in introducing the incentive, there is a case for shifting the population to public transport and vehicles using diesel rather than petrol (Table 5). For the last two years, the Government has been announcing that it would introduce buses in Kampala, but it has not succeeded to date.

Table 5: Greenhouse gas emissions from vehicles and transportation modes

Vehicle	Load factor (average occupancy)	CO_2 equivalent emissions per passenger-km
Car (petrol) Car (diesel)	2.5 2.5	130–170 85–120
Motorcycle (four-stoke)	1.5	40–60
Minibus (petrol) Minibus (diesel)	12.0 12.0	50–70 40–60
Bus (diesel)	40.0	20–30

Source: Sterling and Salon, 2002:15

Conclusion and way forward

The impact of incentives in this sector is certainly mixed, with achievements recorded in revenue generation, but none to date for the environment. With substantial revenue generated, the Government should invest in information gathering to address the wider aspects in the transport sector in addition to environmentally hazardous old cars. These include using the revenue to open up new roads and reduce congestion, reduce other taxes on vehicles used by the poor (e.g. buses) and establish a fund to revitalize the railway system.

5. Economic instruments for the water and sanitation sector

Waste water discharge fees for water pollution

In 1998, the Government formulated the Water (Waste Discharge) Regulations under which it introduced wastewater discharge fees in proportion to the biological oxygen demand (BOD) to control pollution, as shown in Table 6. The annual charge was aimed at: (i) providing incentives for conservation and minimization of water wastage; (ii) influencing users' habits in consumption and use of water; and (iii) encouraging a reduction of pollutant concentration in wastewater discharge and enhancing environmental conservation. Further, the Regulation set out obligations for the holders of a waste discharge permit to follow the standards for treated effluent or waste before discharge into water or on land and install anti-pollution equipment for the treatment of effluent and waste discharge emanating from the industry or establishment, among others. The regulation was very comprehensive: it defined waste to "include sewage and any other matter or thing whether wholly or party in solid, liquid or gaseous state, which if added to any water, may cause pollution". Activities and trades in listed in Schedules 2 and 3 of the Regulation (see Annexes 2 and 3) were to be governed under the Regulations, but not all are currently fully regulated especially the total suspended solids.

Table 6: Pollution charges (waste discharge fees)

BOD Load	Unit Charge (U Sh per kg oxygen)	Annual Charge (U Sh)
100 and under	Not charged	Not charged
100–400	2.0	500,000
400–600	2.0	1,000,000
600–1,800	2.1	2,500,000
1,800–3,000	2.1	5,000,000
3,000–3,800	2.2	7,500,000
3,800–5,200	2.2	10,000,000
5,200 and above	2.5	13,000,000

Source: National Water Development Report, 2005.

When the waste discharge fees were being planned, a number of decisions were taken in light of the available information and facts. It was planned, for example, to adopt a 'phased and gradual' approach to recognize the limited administrative and technical capacity and laboratory facilities at the time. This meant, *inter alia*, that the permits would first concentrate only on a limited range of polluting activities and focus on BOD as a basis for levying charges for discharging above permitted levels.[10]

A question arises as to what consideration was given to set the pollution fees, as indicated above. To maximize efficiency, economic theory dictates that discharge fees should be set at the level where marginal abatement costs are equal to marginal environmental damages. This prescription was not

[10] Presently, and as seen from Figures 8a and 8b, it is recognized that total suspended solids (TSS) should also be should also be made subject to the levy/charge.

followed in setting the discharge fees, because studies leading to their introduction did not include information on pollution abatement and environmental damage functions. In the literature, the basic strategy to use in the absence of this information is to first set pollution reduction goals in each watershed, and then use trial and error to adjust fees until the goals are met (Baumol, 1972; Baumol and Oates, 1975). This strategy of setting targets also was not pursued.

Rationale

The rationale for introducing the Water (Waste Discharge) Regulation and the related waste discharge fee is summarized in the National Water Development Report (NWDR, 2005). The report considers Uganda's freshwater resources as a key strategic resource, vital for sustaining life, promoting development and maintaining the environment. Access to clean and safe water and improved sanitation facilities are prerequisites to a healthy population and therefore have a direct impact on people's quality of life and productivity.

The Regulation was necessary and justified to give effect to the implementation of several laws. One of these is the Water Act 1995, which contained general provisions with regard to the declaration of prohibited waste by the Ministry; application for a waste discharge permit; and prohibition of pollution among others. The other, is the Constitution of Uganda, 1995. The 21st general principle of the Constitution states that "the state shall take all practical measures to promote a good water management system at all levels". In addition, it includes "a right to a clean and healthy environment" as one of the fundamental human rights. Finally, the Regulation complements other regulations and standards, as shown in Box 3.

Box 3: Regulations and standards for controlling pollution

i. Water (Waste Discharge) Regulations 1998
ii. Regulations on environment impact assessment 1998
iii. Regulations on waste management 1999
iv. Regulations on the management of river banks, lake shores and wetlands 2000
v. Regulations on the management of hilly and mountainous areas 2000
vi. National Environment Instrument (delegation of waste discharge functions) 1999
vii. Standards for discharge of effluent onto land and water 1999
viii. National Environment Notice (Designation of Environment Inspectors 2000)
ix. Minimum standards for the management of soil quality 2001

Findings

Since the introduction of the waste discharge fees in 1998, a total of 53 permits were issued by 2008. When one considers that some institutions had applied for more than one permit to cover their operations in different parts of the country, the total number of institutions coming forward to be governed under the Regulation was only 27 (Table 7).

National Water and Sewerage Corporation (NWSC) alone held 14 of the permits, followed by Kinyara Sugar Works and James Finlay's, each with five permits. In addition, most of the permits are held by institutions in Kampala (twelve), followed by Masindi (five) and Mbarara, Jinja and Mpigi (four each).

At the time of planning the introduction of the waste discharge fees in 1998, it had been estimated that 200 dischargers carrying out specified activities and trades (Annexes 2 and 3) would be regulated. Presently, the Ministry of Water and Environment estimates that there should be at least 335 waste discharge permit holders. Assuming the latter, the compliance rate is 8 percent only. In short, the Ministry has lacked the capacity to enforce the regulation. Recent efforts to engage with the polluting industries to remind them of their obligations under the regulation should be sustained.

In the meantime, the consequences of very poor compliance are that society and the environment are vulnerable to the risk of continued and poorly regulated pollution and the Government is not collecting the revenue that it would plough back to improve water resource management, including pollution control. With regard to the latter, if one assumes that at least 75 percent of the 335 institutions were complying and were in the median category of pollution, the Directorate of Water Resources would collect a sum ranging from U Sh740 million to U Sh1,327 million (US$477,580 to US$856,612) annually. Such additional resources would go a long way to enforce the provisions of the Regulation.[11]

[11] It should be noted that the Directorate grants other permits, for instance, surface water abstraction, ground water abstraction, drilling, construction and hydraulic works. These are not the subject of this study.

Table 7: Institutions with Wastewater Discharge Permits as of April 2008

Institution	No. of Permits held
National Water and Sewerage Corporation	14
Kinyara Sugar Works Ltd.	5
James Finlay's Uganda Ltd.	5
Century Bottling Company	3
Mukwano Industries (Uganda) Ltd.	2
Gombe Fishing Industries Ltd.	2
Steel Corporation of East Africa Ltd.	1
Aqua Harvest (U) Ltd.	1
Nile Breweries	1
Ministry of Education and Sports	1
Greenfields (U) Ltd.	1
Kakira Sugar Works	1
A.K. Detergents (U) Ltd.	1
Ngege Ltd.	1
AES Nile Power Ltd.	1
Britania Allied Industries Ltd.	1
Mweya Safari Lodge	1
Uganda Breweries Ltd.	1
Masese Fish Packers Ltd.	1
International Distillers (U) Ltd.	1
Uganda Marine Products Ltd.	1
Ugachick Poultry Breeders Ltd.	1
Fresh Water Fish Exporters (U) Ltd.	1
Oakwood Investments Ltd.	1
Kasese Cobalt Co. Ltd.	1
Crown Beverages Ltd.	1
Harris International Ltd.	1

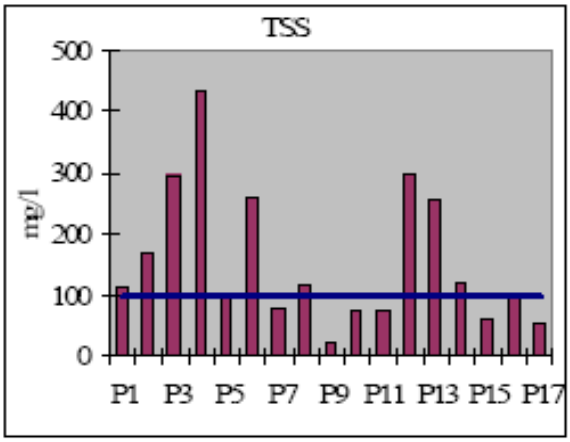
Source: Directorate of Water Resources

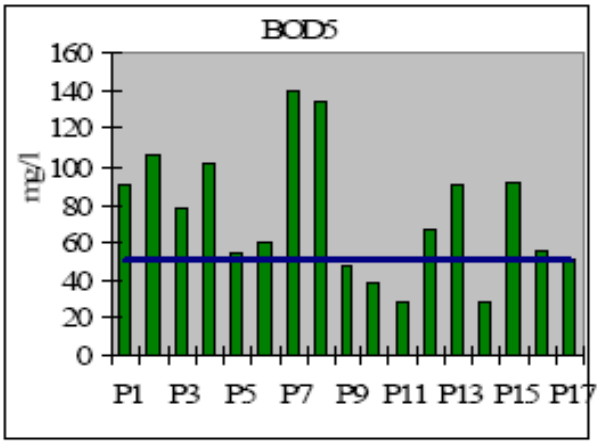
With regard to the environment, a study conducted in 2001 (MacDonald *et.al.*, 2001) established that of the estimated total pollution loads being discharged into Lake Victoria, urban municipal loads accounted for 77 percent, fishing villages for 15 percent and industries for 8 percent. Studies conducted by NEMA in the recent past attributed the rising levels of urban pollution to poor sewerage infrastructure, poor on-site sanitation and untreated industrial effluent. Figures 8a and 8b show effluent characteristics from 17 sewage treatment plants for the major towns in Uganda. The figures show that many of these plants do not meet the National Discharge Standards. The situation is even worse in smaller towns without (or with non-functional) treatment plants, where the sewage is disposed directly into the environment, without pre-treatment.

The main concern is that the lack of a critical mass of institutions complying with the Regulation shows that the few who are complying are disadvantaged due to incurring costs of securing discharge permits that others are dodging. This creates an unlevel playing field. In addition, the potential risk to human and aquatic life remains high. The main implication is that as long as most

urban municipalities do not comply with the provisions of the Regulation, there can be no breakthroughs in changing the culture of pollution management in the country.

Figures 8a and 8b: Effluent characteristics of 17 sewage treatment plants





Note: Horizontal lines show National Discharge Standards
Source: National Water Development Report, 2005

With regard to abuse, there are a number of reported cases of discharge of untreated industrial effluent into waterways or leakage/spillage of chemicals during storage and transportation. Most industries in Uganda do not have effluent treatment plants, and where they exist, they are poorly designed and managed. Results from a 2001 study (MacDonald *et al.*, 2001) on the pollution of Lake Victoria indicated that industries around Lake Victoria discharge 1,045 kg/day of BOD, 96 kg/day of nitrogen and 105 kg/day of phosphorus into the lake. According to a survey carried out under the same study, of the 25 industries sampled, only one had a treatment plant meeting required effluent standards; 15 had no treatment plants; three did preliminary treatment; four did primary treatment; and three had secondary treatment.

The above survey also revealed that Uganda Breweries, located at Port Bell on Lake Victoria, alone accounts for 80 percent of the BOD load and 85 percent of the COD load, 93 percent of the SS load, 60 percent of the total nitrogen load and 82 percent of the phosphorus load discharged by industries, on the Ugandan side, into Lake Victoria. In order to address this problem, Uganda Breweries, with support from Lake Victoria Environment Management Project (LVEMP), constructed a wetland to treat the industrial effluent using papyrus (*Cyperus papyrus*). This cannot have a positive impact if the municipalities from which 77 percent of pollution is emanating are not satisfying the emission standards.

Owing to the above failures, cholera and other water-borne diseases are now a common occurrence in Kampala and other towns, especially during the rainy season. The number of patients suffering from persistent diarrhoea registered at Mulago Hospital alone has sharply risen from 9 percent to 32 percent in the last three years. The media has also carried feature articles on the deteriorating water quality of water bodies such as Lake Victoria. The negative consequence for aquatic biodiversity could be high.

Evidence from other countries suggests that it is feasible to reduce pollution using a combination of legislation, standards and EIs (Box 4), and investing the revenue from the EIs to improve the

environmental quality. In addition to Malaysia, described in Box 4, the Netherlands introduced water effluent charges as well as CAC regulations in order to finance the construction of water treatment facilities in compliance with the water quality requirements of the surface Water Pollution Act of 1970. A dramatic decrease in pollution took place in the early 1970s despite the growth in economic activities (Lovei, 1995).

Similarly, in Colombia, the earmarking of revenue from discharge fees was popular because it made them more politically palatable by returning revenue to those disadvantaged by the fees. It was also seen as a means of correcting for market failures that prevent firms from obtaining the investment credit (Blackman, 2005). The discharge fees created enough incentives for polluters to cut emissions in a cost-effective manner. Pollution loads dropped significantly after the programme was introduced. There was a condition that "if revenues from charges are earmarked for environmental expenditures, it is important to have a coherent, transparent, and accountable allocation system with clear financing objectives and priorities" (World Bank, 1998).

Box 4: Combining legal frameworks, standards and disincentives to control pollution

In 1974, Malaysia enacted the Malaysian Environmental Quality Act with provisions for using economic incentives and disincentives. In 1977, the government set effluent discharge fees for controlling pollution from palm oil mills. It targeted those who discharged waste into public water bodies. It combined the fees with discharge standards. Implementation began in 1978. Fees paid by mills varied with standards. Over time, the standards were made more stringent while fees were increased. Within only six years, the results were dramatic and impressive. Despite an increase in the number of palm oil mills by 50 percent and an increase in the palm oil production, total biochemical oxygen demand (BOD) load released in public water bodies dropped consistently from 222 tonnes per day in 1978 to 5 tonnes in 1984::

Results **1978–1984**

Year	*Standard*	*Effluent charge*	*Effluent per day*
1978	5,000 mg/l of BOD	US$3 per tonne of BOD	222 tonnes
1980	2,000 mg/l of BOD	US$100 per tonne above standard	58 tonnes
1982			19 tonnes
1984	100 mg/l of BOD		5 tonnes

Source: Theodore Panayotou, 1992

Conclusion and Way Forward

Under the current management regime, the discharge fee for controlling pollution is not serving the purpose for which it was intended; weaknesses remain at the legal, institutional and operational levels. Considering a projection that Uganda will be a water-scarce country in 2020 due to a high population growth rate (Republic of Uganda, 2005), there is need to look at wider issues in water management, including efficiency in the entire water cycle.

The Water Resources Management Reform Strategy 2005–2015, in which some of the weaknesses found under this study could be addressed, provides the opportunity to revise and improve the pollution fee-related issues, including: (i) amendment of the Water Act, Cap 152 and the Water Regulations to provide for a longer duration of the different permits and periodic review, and to make it compulsory rather than optional to apply for a pollution permit; (ii) harmonization of the

Water (Waste Discharge) Regulations and the National Environment (Standards for the Discharge of Effluent in Water or on Land) Regulations; (iii) harmonization of the issuance of guidelines for pollution control between the Director, of the Directorate of Water Development (DWD) and the Executive Director of NEMA, as well as delegating the function to issue pollution licences from NEMA to DWD; and (iv) harmonization of the legislation and standards for pollution management of trans-boundary water resources. Institutionally, it is recommended that the Water Resources Management Reform Strategy WRMRS outsource some of the functions, such as water quality testing, ensure that environmental audit be cost-effective in reaching the large constituency of polluters, and continue to build its capacity to enforce the Regulations. The Directorate also needs to continue its efforts in raising polluters' awareness of their corporate responsibilities to prevent pollution.

6. Economic instruments for the agricultural sector through the financial institutions

Tax waiver on interest earned by financial institutions on agricultural loans

During the Government's Budget Speech in 2005, it proposed an incentive for agriculture through financial institutions thus:

> *According to the results of the 2002 Population and Housing Census, agriculture accounts for the livelihood of a very large proportion of the population. Despite this, access to finance is still poor. In order to encourage lending to the agricultural sector, I am proposing that interest earned by financial institutions on loans granted to persons engaged in agriculture be exempt from tax..*

After two years of offering the above EI, the Government felt that financial institutions had not received enough incentives to lend to agriculture, and therefore announced an additional incentive in 2007:

> *In the 2005/06 Budget Speech, [the] Government announced that interest earned by financial institutions on loans granted to persons engaged in agriculture be exempted from tax. The purpose was to encourage banks to extend credit to the Agricultural Sector. However, this has been hampered by the costs incurred by financial institutions and the bad debts that they register which have not been deductible as expenses. This therefore keeps the interest rates still high. Mr. Speaker Sir, in order to further encourage banks and to reduce the costs of lending to the Agricultural Sector, I am proposing that expenditures and losses and bad debts incurred in lending to the agricultural sector be deductible for tax purposes (MFPED, 2006).*

Rationale

The 2002 Population and Housing Census reported that 73 percent of the population was engaged in agriculture. This has not changed much. The Uganda National Household Budget Survey, 2005/06 revealed that 78.8 percent of all the households practise agriculture, predominantly on a small scale, using an average of only 0.9 ha owned and 0.4 ha under user rights, for a total of 1.3 ha per household (UBOS, 2007:20). In addition, the Government is using the Plan for Modernization of Agriculture (PMA) and related National Agricultural Advisory Services (NAADS) to raise the incomes of the poor.

Under both the Poverty Eradication Action Plan (PEAP) and PMA, the Government recognizes the connection between promoting agriculture for rural incomes and sustainable use of natural resources. Research conducted for PEAP established that farming practices that contribute to soil nutrient depletion pose a significant threat to land productivity in Uganda (Yaron *et al.*, 2004). Another study found that 95 percent of farmers in a sample took out more nutrients from the soil than they put back into it. Above all, the Constitution of Uganda vests the land in its citizens. The citizens themselves are responsible for management of other natural resources on their land such as forests, wildlife, biodiversity and wetlands.

Findings and discussion

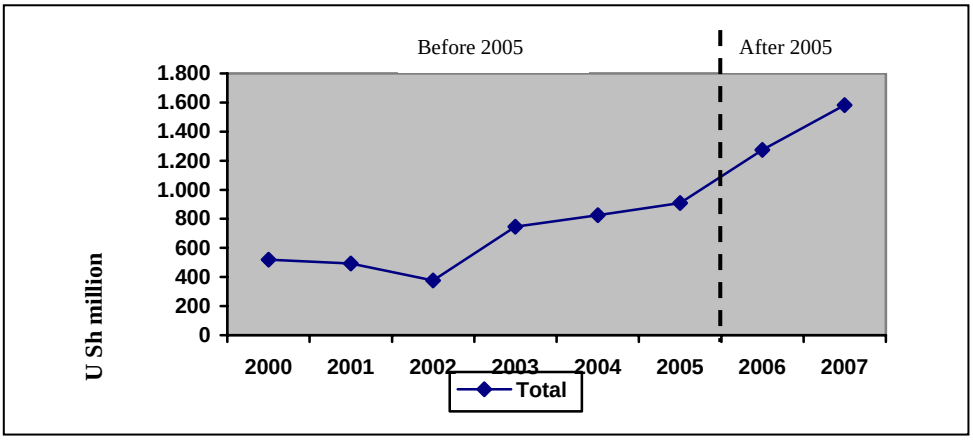
It was found that commercial bank lending to all sectors increased after the incentive was announced in 2005 (Figure 9). However, after 2005, lending to agriculture fell in absolute amounts for both production and crop finance. It also fell in comparison to other sectors (Figures 10 and 11). Simply put, the incentive announced for agriculture through financial institutions has not yet generated the impact for which it was intended. As Figure 11 shows, it is the mining, quarrying and other services that have systematically absorbed most of the credit since 2002. The main lesson learned is that other sectors are currently outcompeting agriculture for bank loans.

Under such circumstances, the Government is challenged to study whether the incentive it announced will actually cause banks to reposition for agricultural lending. Until this occurs, it would be too optimistic to think that substantial, if any, credit is borrowed for investing in natural resource management as part of general agricultural borrowing.

The low level of lending to agriculture by financial institutions is not unique to Uganda. The 2007 *World Bank Report on Making Finance Work for Africa* recognizes that access to credit is more restricted in agriculture than in other sectors, and more restricted in rural than in urban settings. Traditional loan products are seen as poorly suited to subsistence agriculture. The risk of crop failure and price volatility makes it difficult for cash crop farmers to secure bank financing.

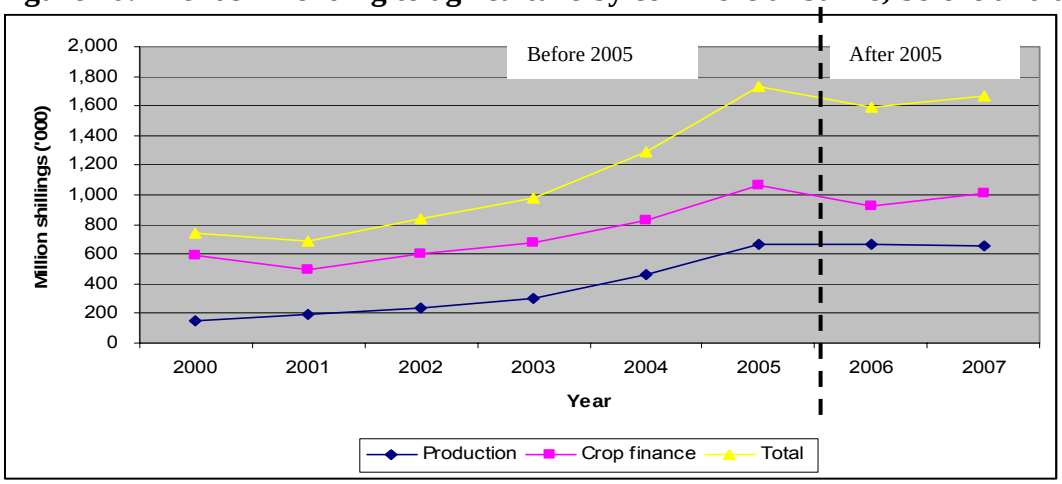
In some countries, state-owned development financial institutions (DFIs) have been used to lend to the agricultural sector on the grounds that the large commercial banks have limited information and experience in this area and therefore face high transaction costs. Although this argument is valid, DFI performances as a means of delivering credit to agriculture, let alone small-scale farmers, has been very poor (World Bank, 2007, *Report on Making Finance Work for Africa*, Chapter 3). In 1985, Uganda abandoned the idea of establishing the Uganda Agricultural Finance Agency (UAFA) specifically to lend to agriculture. Other schemes such as the Rural Farmers' Scheme, operated under the then Uganda Commercial Bank (now Stanbic Bank) in early 1980s and the *Entandikwa* (start-up capital) in 1990s, all targeting the poor, failed. By implication, there are still wider issues that act as barriers to lending to the poor in Uganda.

Figure 9: Trends in lending to all sectors, before and after 2005



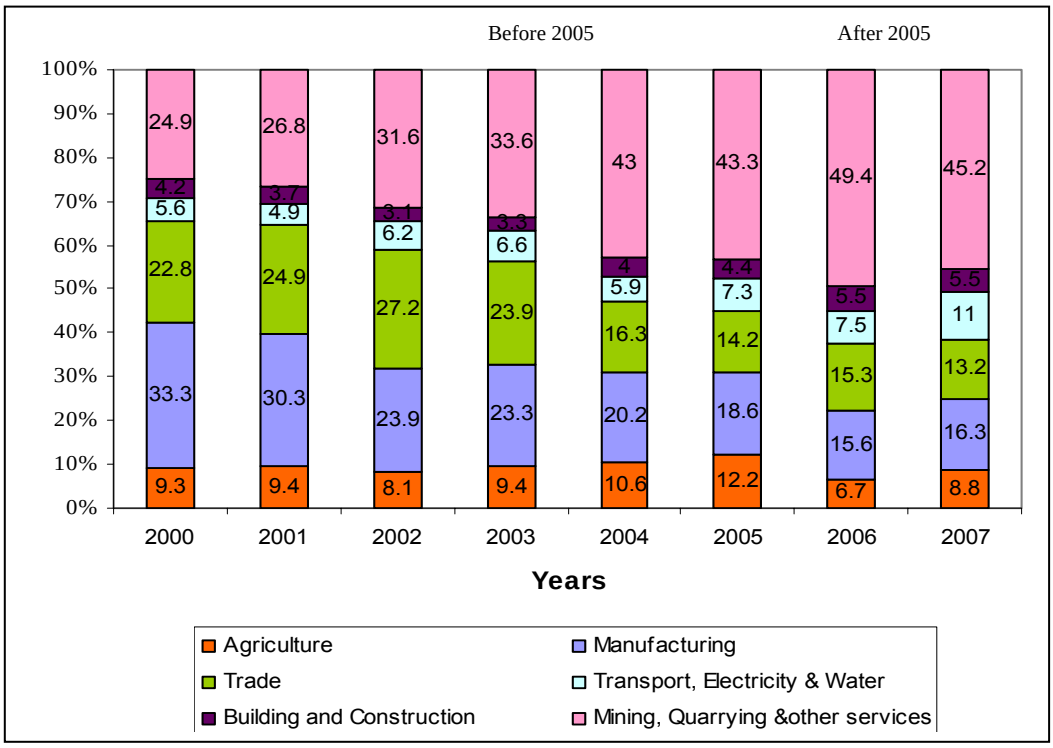
Source: BoU Research Department, 2008

Figure 10: Trends in lending to agriculture by commercial banks, before and after 2005



Source: BoU Research Department, 2008

Figure 11: Distribution of credit, before and after 2005



Source: BoU Research Department, 2008

It is also still too early to trace a measurable change in lending to agriculture after additional incentive to financial institutions announced in 2007. However, the income of commercial banks is known to come mainly from interest on advances (including to agriculture), which was 43 percent in 2006. They also make substantial income on government securities (20 percent) [12] (BOU, 2007). The African Association of Public Administration and Management (AAPAM) argued that as long as the Central Bank continues to borrow from commercial banks, it will inevitably squeeze the available resources available for bank lending to the private sector.

Moreover, it would also be attractive for commercial banks to lend to the Central Bank to avoid the constraints that they encounter in lending to agriculture. These include: (i) the small size of loans and related high transaction costs; (ii) seasonality of agricultural production leading to a lag between investment needs and expected revenues; (iii) lack of acceptable collateral; and (iv) climate change-related risks.

It has been shown, for example, that a rise in temperature by 2 ^{0}C would reduce the acreage of Robusta coffee – a previously great foreign exchange earner and absorber of crop finance – by about 75 percent (MFPED, 2004). The main challenge, therefore, is for the insurance companies to explore the possibility of developing insurance products to mitigate against climate change-related risks in agriculture. Ethiopia has developed such products and Kenya is also following this strategy of developing similar products.

[12] Other interest income makes 7 percent, while non-interest income makes 31 percent.

Another challenge that banks must address is to lower the proportion of their non-performing assets to total assets; as of March 2008, they stood at 3.94 percent. Although the Bank of Uganda considers them within the prudential limit of 10 percent, they can be discouraging in a competitive market where demand for credit is still low. For example, only one in ten households (10 percent) applied for credit in 2005/06, the demand being highest in the western region (16 percent) and lowest in the north (4 percent) (UBOS, 2007). Most loan applicants sought credit from informal financial institutions (24 percent), followed by semi-formal sources (5 percent) and finally by formal sources (2 percent).

It can be asserted from the above that although the incentive was targeted at poor farmers, the financial institutions command a very small source of peoples' borrowing, that is, only 2 percent. In sum, targeting poor farmers through financial institutions was not a choice that would benefit them. Access to credit by poor farmers is further constrained by inadequate collateral, high interest rates and non-availability of credit facilities. It was found that 23 percent of households did not apply for loans because they did not want to be in debt, while 19 percent did not apply due to inadequate collateral and 20 percent felt it was not necessary. Only 8 percent reported high interest rates and 7 percent reported non-availability of credit facilities as a barrier. The government is addressing concerns over high interest rates by registering additional commercial banks. The key observation is that the Government needs to address a wide range of issues concurrently and adequately.

Uganda is registering a high growth rate in microfinance institutions (MFIs), but it is still too early to consider them as alternative channels for delivering agricultural credit. Most of them are also located in urban and peri-urban areas. They fall under Tier IV of the Financial Institutions Act and are therefore prohibited from taking savings from the public to boost their loanable funds. Another concern is the high interest charged by MFIs compared to commercial banks. Loanable funds from commercial banks as wholesalers to MFIs for retailing to rural customers are forthcoming at an average interest rate of 17–19 percent, to which MFIs add their own profit margins, with the final interest rates to customers rising to 30–48 percent. In this case, the returns to farming may not be sufficient to cover these costs or the uncertainty too high to justify borrowing. Many of them are yet to lower their operational costs through innovative use of technology and organizational skills. Commercial banks view MFIs just like any other customer competing for their funds (Ssemogerere, 2004).

In 2008, the Government, through the national budget, announced additional incentives for agriculture through financial institutions. It also announced other measures that would collectively benefit agriculture, including: (i) an increase in resources for NAADS by 62 percent to allow people in rural areas to obtain the necessary agricultural inputs and machinery to increase production; (ii) the tripling of resources for microfinance from U Sh10 billion in 2008 to U Sh 32 billion in 2009; (iii) an increase in resources for road infrastructure from U Sh625 billion in 2008 to U Sh1.1 trillion in 2009; and (iv) tax exemptions to encourage investment in agricultural processing in rural areas. However, unless there is a very clear focused approach, the above measures would not necessarily equally benefit environmental aspects of agricultural development.

Conclusion and way forward

The Government undoubtedly needs to continue its support to agriculture which offers employment to 78.8 percent of the population. The rationale to continue engaging the financial institutions is because they still offer the highest sources of loanable funds. In this endeavour, the Government needs to gather information on how agricultural modernization also takes into account the need to enhance environmental services.

In its *World Development Report for 2008* entitled *Agriculture for Development*,[13] the World Bank stressed the importance of a renewed emphasis on agriculture with consideration of environmental services. The report argues that "for the poorest people, GDP growth originating in agriculture is about four times more effective in reducing poverty than GDP originating outside the sector" (World Bank, 2007). The report further stated that agriculture contributes to development as an economic activity, as a livelihood and as a provider of environmental services, making it a unique instrument for development (World Bank, 2007):

> *In using and frequently misusing natural resources, agriculture can create good and bad environmental outcomes. It is by far the largest user of water, contributing to water scarcity. It is a major player in underground water depletion, agrochemical pollution, soil exhaustion and global climate change, accounting for up to 30 percent of greenhouse gas emissions. But it is also a major provider of environmental services, generally unrecognized and unremunerated, sequestering carbon, managing water sheds and preserving biodiversity".*
>
> *"With rising resource scarcity, climate change and concern over environmental costs, business as usual in the way agriculture uses natural resources is not an option. Making the farming systems of the rural poor less vulnerable to climate change is imperative".*
>
> *Managing the connections among agriculture, natural resource conservation and the environment must be an integral part of using agriculture for development".*
>
> Donors need to play a vital and long-term role to support the Government to integrate environmental services in the agricultural sector, mainly because without such support, farmers will search for short-term gains only, which would not be sustainable in the long term.

[13] http://go.worldbank.org

PART III

Shaping the future for more promising results

Part III lists the generic procedures that should guide the Government in introducing economic instruments (EIs) for environmental management. Based on the lessons learned from Uganda and elsewhere, it offers strategies for incorporating them into the five-year National Development Plan.

7. Adopting a generic procedure for using economic instruments for sustainable development

Summary of lessons learned from case studies

It has emerged from the study that:

- Uganda is implementing a wide range of EIs for environmental management in several sectors (Annex 1). Owing to the lack of a central coordination mechanism to monitor their implementation and impacts, the use of these instruments provide very limited returns to society.

- Countries that continue to reap multiple benefits from EIs have been guided by focused studies involving all relevant stakeholders.

- Like any policy instruments, the implementation of EIs can generate negative effects on some segments of society, including the poor. Their implementation should incorporate measures to mitigate or compensate for any adverse effects.

- Uganda is capable of reaping multiple benefits for the environment, poverty reduction and revenue generation from the many EIs it is implementing. However, evidence show that the Government is still finding it difficult to maintain a pro-poor focus and strategy in their implementation.

- The commitment of the Government to the environment has been reflected in the revenue that it has forfeited on some goods and services, notably, energy goods and agricultural lending. It has lost substantial revenue due to poor enforcement of Water (Waste Discharge) Regulations, 1998. However, the revenue that it has raised on others, particularly on environmentally hazardous goods, has greatly offset the forfeited and lost revenue. The government is still lacking a strategy to use some of these internally generated funds to address some of the pending constraints to effective implementation of EIs.

- A key factor still holding back the effectiveness of EIs is the failure to identify and sometimes enforce complementary CAC measures.

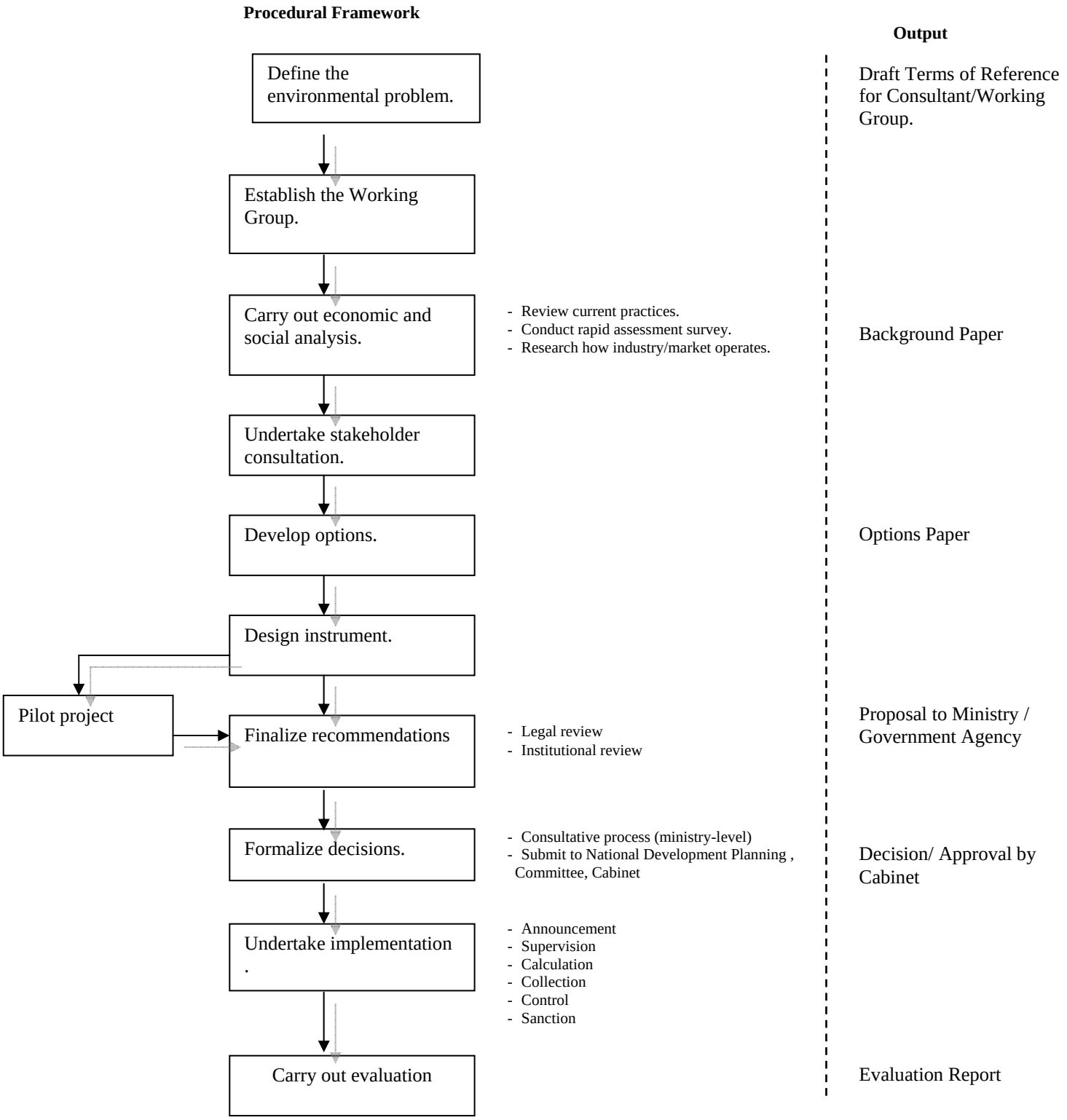
- It also takes a great deal of time to realize the benefits of EIs, especially for the environment. When constrained, countries can be tempted to deal with short-term solutions, with a likelihood of withdrawal. Given that development is long-term process, the operationalization of EIs must also be placed in this context.

- The Ministry of Finance, Planning and Economic Development has taken centre stage in announcing most of the EIs that have been reviewed. It would be strategic for the Ministry to pursue a more inclusive and comprehensive environmental fiscal reform programme to address many bottlenecks identified by this study.

Generic procedures for economic instruments

The case studies on EIs lacked a repository of information and studies leading to their introduction. This is a great weakness because it becomes difficult to monitor them. To tap the benefits from these instruments, the Government needs to adopt a procedure for their introduction and use. Figure 12 shows the generic procedures for EIs.

Figure 12: Framework to develop and design an economic instrument



It should be pointed out that operating EIs is a highly political negotiation process that concerns not only the interests of the Government, but also those to whom they are targeted as well as the general public. Also, since EIs address three broad objectives – environmental management, poverty reduction and revenue generation – the studies leading to their introduction must bear these in mind. Information gathering at all stages in Figure 12 is critical.

Monitoring and evaluating impacts of economic instruments

The objectives for which EIs are introduced indubitably set the benchmark against which they are monitored and evaluated. There are other wide effects that should also be not ignored: effects on the respective sector; employment effects; effects on prices and access to services; sector or industrial competitiveness; regional effects; and costs of securing compliance.

Guiding criteria to bear in mind

Box 5 provides the criteria to take into account in all decisions relating to the selection and operation of EIs.

Box 5: Checklist of criteria for selection of incentives or disincentives

1. *Environmental effectiveness*
   - Will the instrument achieve the environmental objective within a specified time span?
   - Will the instrument make those to whom it is targeted engage in pollution abatement, technical innovation, product substitution or sustainable resource use methods?

2. *Economic efficiency*
   - Will the instrument achieve the environmental objective or target at the minimum possible cost to society?

3. *Equity*
   - Will the costs and benefits of the instrument be equitably distributed?

4. *Legal and policy backing*
   - Is the instrument consistent with the legislative framework?

5. *Acceptability*
   - Is the instrument understandable to the public, acceptable to the industry and politically saleable?

6. *Flexibility*
   - Is the instrument flexible enough to adjust to changes in technology, the resource security and market conditions?

7. *Dynamic efficiency (inbuilt in market based instruments)*
   - Does the instrument provide stimuli for developing and adapting new environmentally cleaner and economically more efficient technologies?
   - Does it promote development of an environmentally friendly infrastructure and economic structure in general?

8. *Ease of monitoring and enforcement*
   How difficult or costly will monitoring and enforcement be?

Source: NEMA, 2002

8. Strategic choices for the five-year National Development Plan

Reviewing the economic instruments

Evidence from the case studies has pointed to the conclusion that the socio-economic setting of EIs and the implications for their feasibility, to deliver on the objectives for which they were introduced, were not fully grasped. At a time when the Government is forfeiting substantial revenue to ensure that the EIs benefit the poor, there is cause to support a comprehensive environmental fiscal reform programme. Annex 1 has shown that there are many EIs in use in the country. Essentially, their strengths, weaknesses and shortcomings are not known. The Ministry of Finance, Planning and Economic Development, working in liaison with sectoral agencies, should lead in the reform programme.

Establishing new sets of economic instruments

There are many opportunities emerging that warrant Government studies of the possibility of introducing new EIs. In the Budget Speech 2008, it announced that it would pass the Fisheries Bill in this financial year. The Bill proposes a fish levy. If well studied and successfully collected, this could generate revenue to support research, monitoring and structures. Other opportunities are the much-talked-about carbon finance, and payments for ecosystem services (PES). The policy, legal and institutional framework to tap these markets needs to be developed.

Challenging and supporting the business sector to finance environmental management

It has been shown that some business entities are taking advantage of the Government's removal of taxes to make a profit, without allowing the poor to access critical services, such as modern energy. To prevent such entities from hiding behind the liberalized market, the Government needs to challenge them to demonstrate how they are investing in promotion, information and distribution systems targeting the rural poor.

The lack of special lines of credit for the environment leaves no choice for industries but to keep old technologies, even where they would have shifted to new ones. The Government could use some of the revenue raised to contribute to, for instance, an environmental innovation fund for this purpose. Lessons learned from the innovation fund interventions could break the barrier of financial institutions in developing products in the name of the environment.

Capacity building among lead agencies

The weakness of sectoral and lead agencies in following up the implementation of EIs has been shown. The government needs to support a programme to address the weaknesses.

Annex 1: Economic instruments and their application to sectoral and environmental issues in Uganda

Environmental issue	Property Rights	Market creation	Fiscal Instrument	Charge Systems	Financial Instruments	Liability Systems	Bonds & Deposit Refund Systems
1. Sustainable Land Management	- Land title	- Eco-labelling (organic products)	- Tax waiver to banks lending to agriculture		- Grants - Subsidies		
2. Water for production and consumption		-		- Water tariffs			
3. Fisheries	- Fishing licence	- Certification		- Fish levy			
4. Forestry resources	- Permit	- Forest certification		- Non–compliance fines	- Subsidy (SPGS) - Grants - National Tree Fund		
5. Wildlife	- User rights	- Eco–tourism		-	- Sharing Revenue - Wildlife Fund		
6. Wetlands	- Communal property rights	-	–	- User charges			
7. Biodiversity		- Bio–trade			- Trust funds, e.g MBIFCT - Global Environment Facility's(GEF)/SGP - Sinking funds		

8. Energy access		- Carbon sequestration off–sets	- VAT waiver on solar systems and LPG	- Electricity tariff	- Payment for ecosystem services - Subsides - Energy Fund		
9. Minerals	- Mining rights			- Royalties			
10. Urban settlement and traffic management				- Parking fees - Environmental levy on old cars and appliances			
11. Pollution and waste management			- Tax differentiation	- Water treatment fees - Water pollution fees - Waste collection charges		Non-compliance charge	Oil spill bond
12. Climate change		Carbon sequestration offsets		- Environmental levy on hazardous materials			

Annex 2: Second schedule of the Water (Waste Discharge) Regulation on Prescribed substances (Regulation 5(i)(b)(ii).

Aldrin	Parathion
Atrazine	Parathion methyl
Arsenic	PolyChloroBiphenyls (PCBs)
Azinphos-methyl	Pentachlorophenol (PCP) and its compounds
Boron	Perchloroethylene
Cadmium and its compounds	Permethrin
Carbon tetrachloride	Polychlorinated biphenyls
Chloroform	Simaxine
Chromium	Copper
Cyanide	Tetracliloroethylene
Cyfluthrin	Tributyltin compounds
DDT	Trichlorobenzene
1.2-Dichloroethane	Trichloroethane
Dichlorvos	Trichloroethylene
Dioxins	Trifluralin
Endosulfan	Triphenyltin compounds
Endrin	Vanadium
Fenitrothion	Zinc
Flucofuran	Sulcofuron
Hexachlorobenzene (HCB)	Azinphos-ethyl
Hexachlorobutadiene (HCBD)	Substances prescribed by other law [laws?]in force
Hexachlorocyclohexane (Lindane and related compounds)	
Iron	
Lead	
Malathion	
Mercury and its compounds	
Nickel	

Annex 3: Third Schedule of the water (Waste Discharge) Regulation on Prescribed Trades and Premises

Airports
Breweries
Mines and processors
Coffee factories
Commercial fish farms
Fish processing factories
Fruit and vegetable processing factories
Hospitals
Leather tanning factories
Meat processing factories
Mineral extraction and processing
Oil factories
Plastic manufacturers
Sewerage treatment plants
Slaughtering works (as may be identified by the Director)
Soap factories
Soft drink manufacturers
Steel rolling mills
Sugar factories
Textile factories

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