



EU-ASIA PRO ECO II B Post -Tsunami Programme

Demonstrating ESTs for Building waste Reduction in Indonesia

The DEBRI Project

Background Document on
Economic Instruments
with special reference to
Debris and C&D Waste Management

Prepared by

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International Solid
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Government of
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Background to this Document

This background document is being prepared as a part of the deliverables of the DEBRI Project in order to:

- *enhance awareness of the national and local context in which economic instruments function*
- *assist governments in identifying circumstances and opportunities for the use of economic instruments, and make them more acceptable and viable at local and national levels;*
- *assist governments in making use of economic instruments to achieve national environmental objectives;*
- *promote use of economic instruments to achieve the objectives of the DEBRI Project.*

While Part I of this document provides an overall introduction to the importance of economic instruments, within the perspective of broad sustainable development, Part II provides the contextual basis to introduce economic instruments in the DEBRI Project, for waste management and for construction and demolition debris.

This document will form the basis of work to be carried out by a DEBRI Consultant, in partnership with national and local partners of the project, to develop a set of recommendations on preferred economic instruments to the Government of Indonesia.

NOTE:

The DEBRI project was envisaged as a demonstration project to ...

This is the reason why this document contains discussion of economic instruments for wastes in general, while also specifically focusing on construction and demolition debris from disasters. Such an approach also helps in integrating disaster debris management within the overall waste management of a city (rather than as an ad-hoc separate activity).

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Annex I: Comparisons of Economic Instruments for Waste Management

PART I

The Importance of Economic Instruments

1.0 What are Economic Instruments¹ ?

Simply put, economic instruments are measures that provide economic incentives for sustainable development and disincentives for practices that degrade the environment or deplete natural resources.

Typical economic instruments include measures such as charges, pollution taxes, tradable pollution permits, transferable development rights or payments for environmental services, among others.

Economic instruments provide market and financial incentives (and disincentives) for polluters and natural resource users to change their behaviour. The economic instruments incentives include such mechanisms as taxes, emission or access charges, marketable permits, and changes to property rights.

Economic instruments encompass a range of policy tools from pollution taxes and marketable permits to deposit-refund systems and performance bonds. The common element of all economic instruments is that they operate on a decentralized level through their impact on market signals and trends. Economic instruments are often contrasted to top-down “command and control” policy approaches that determine pollution reduction targets and allowable control technologies, by laws or regulations.

¹ This background note draws heavily from work carried out by UNEP-DTIE’s Economic and Trade Branch in Geneva. The ETB Branch aims to enhance capacities of governments, policy makers, private sector decision makers, and civil society to develop, design and implement economic instruments that contribute to sustainable development and poverty reduction.

In reality however, command and control and economic instrument approaches often operate in tandem. For example, governments may set limits on allowable pollution for a region or country. Market-oriented approaches such as tradable permits are then used to allocate and use the allowable emissions in an efficient manner.

Economic activity to generate goods and services incurs costs not only to the private parties involved in production and consumption (known as “private costs”) but also to the public (known as “social costs”). Social costs include costs of pollution, depletion of natural resources or degradation of the environment.

As these costs are often not included in prices paid by consumers and producers, they are borne by society as a whole. The failure to consider these “external costs” in private decision-making could be corrected through the prudent use of economic instruments, by including them in the prices of goods and services, so as to convey more accurate market signals. Economic instruments are therefore also a means of implementing the “Polluter Pays Principle”

2.0 Economic Instruments and Sustainable Development

The quality of the natural environment and economic well-being are so closely interwoven as to be invisible until a crisis arises.

In the current society we live in, economic activities are a necessary aspect of human survival. Yet, such economic activities result in various impacts on the environment, for example – the release of pollutants into the environment. Economic activities inherently involve the direct or indirect exploitation of natural resources. Increased economic activity raises living standards, but also results in increased emissions of pollutants and use of natural resources. Thus, the price of economic activity can be steep because a healthy environment is equally essential to human existence.

In economics, the environment is viewed as a composite asset that provides a variety of services. It sustains our very existence but belongs to no one. It has many uses, but can be poisoned by a single pollutant. As with other assets, we need to aim for the prevention of

undue depreciation of this asset's value so that it may continue to provide life sustaining and aesthetic services for the foreseeable future.

The environment provides the economy with raw materials, which are transformed into consumer products by production processes using fuels (wood, oil, gas, nuclear, etc.) drawn from the natural environment. These fuels sustain our transport, homes, and offices.

But exploitation of the natural environment creates many environmental problems, including overuse of renewable resources and degradation of the environment. Overuse of renewable resources and production of excessive waste destroy the economic value of the environmental asset. Overuse depletes renewable resources to the point that they are no longer available for economic use and pollutants can exceed the absorptive capacity of nature poisoning the air, water and land.

This interdependent interrelationship between the economy and the environment forms the basis for the development of economic instruments that facilitate and aid sustainable development.

3.0 Role of Economic Instruments

Economic instruments can help achieve sustainable development by creating the financial incentives to change behaviour, in favour of more environmentally friendly and sustainable consumption and production patterns.

As a complement to command and control measures, there is a wide range and different types of economic instruments available to policy makers seeking to address environmental problems. These include property rights, market creation, charges, fiscal instruments, liability systems and removal of environmentally harmful subsidies.

Properly designed and implemented, such economic instruments can increase the cost of environmentally damaging goods and services, generate financial resources for preserving the environment, improve the efficiency and cost-effectiveness of environmental management, and create financial incentives for sustainable investment.

4.0 Economic Instruments as Policy Tools

As policy tools, economic instruments have a number of advantages. If implemented properly – and often in combination with command and control approaches – they can achieve a number of goals and objectives. For example, they can help to:

- Increase prices of environmentally-damaging goods and services, as well as increase the returns to more sustainable approaches leading to more sustainable production and consumption patterns;
- reduce compliance costs by providing flexibility to polluters or users of natural resources to choose the most cost-efficient and environmentally effective measures;
- minimize the overall cost of achieving a given pollution control target;
- create dynamic incentives for investments to innovate and continually improve environmental technology, generating both environmental and financial benefits (“win-win”);
- allocate property rights and responsibilities of firms, groups, or individuals so that they have both the incentive and the power to act in a more environmentally-responsible manner; and
- raise revenues that can be used for environmental purposes or for social benefits (e.g. decreasing income taxes).

PART II

Contextualizing Economic Instruments in the DEBRI Project

5.0 Taxonomy of Economic Instruments for Solid Waste Management

In order to streamline the choice of economic instruments for specific solid waste management targets, a properly laid out menu is also important. Although there is general agreement on the key subcategories of economic instruments, there are still notable differences. A taxonomy of economic instruments for waste management categorizes them into three groups: revenue raising instruments, revenue providing instruments and non-revenue instruments.

5.1 Revenue raising instruments

Revenue raising instruments include various kinds of user charges (levies or taxes) for the provision of collection, transportation and final disposal services. These are directed at “internalizing” the externalities associated with the production, transportation and disposal of wastes.

The revenue raised from such charges could then be earmarked for solving specific problems for which the charge was levied. There are many examples of charges and taxes that fall under the category of revenue raising economic instruments:

- pollution charges, based on pollutant loading;
- waste generation charges, based on waste quantities and degree of waste hazard;
- waste user charges, based on collection and disposal services received;
- waste tipping charges, to unload at transfer or disposal facilities;

- product charges or fees to handle disposal of problem products, such as batteries, tyres and refrigerators;
- disposal taxes, added to disposal charges to influence disposal choices;
- pollution taxes, added to user charges to influence choices for pollution reduction;
- eco-taxes, added to non-renewable energy production or fuels to influence energy demand and fuel choices;
- presumptive taxes, based on presumed levels of pollution; and
- renewable resource taxes, on virgin materials to influence demand for their use and motivate recycling of secondary materials.

Under this category are also subsidies and subsidy removal schemes which are meant to compensate for the cost of solid waste collection, transportation and disposal. In as much as subsidies find vast applications, they are especially desirable in situations where polluters cannot be easily identified. On the other hand, subsidy removal is aimed at discouraging production and consumption behaviour that is harmful to the environment.

5.2 Revenue providing instruments

Revenue providing instruments include subsidies of different kinds that seek to directly reward desired behaviour (waste reduction, improved management, or recycling) rather than penalize the behaviour to be discouraged. Subsidies can be direct payments, reductions in taxes or other charges, preferential access to credit, or in-kind transfers like the provision of land or other resources.

These instruments however, tend to reduce revenues available to the authorities. Examples of revenue providing economic instruments used in solid waste management are presented below:

- tax credits and tax relief, allowances on property taxes, customs duties, or sales taxes to motivate investment in waste management improvements;
- charge reduction, based on proof of recycling or reuse in reducing wastes requiring collection or disposal;

- tax rebates, for pollution savings or energy efficiencies;
- environmental improvement funds, established to support pollution reduction, resource protection, energy efficiency;
- research grants, to stimulate technology development;
- carbon sequestration funds, to encourage purchase of lands that rejuvenate air quality, sometimes as a trade-off by polluters;
- host community compensation, incentives given by host communities to accommodate waste transfer or disposal facilities;
- development rights, long-term leases of land and development rights provided to private companies building waste treatment and disposal facilities, or to those finding remedy to and reclaiming old disposal sites.

5.3 Non-revenue instruments

Non-revenue instruments, which include deposit-refund programmes, combine the incentive effects of charges (when a good is purchased and the deposit is made) and subsidies (when the good is returned or otherwise handled properly and the deposit is refunded) for the management of solid waste. Other incentive-creating policies can include property rights based instruments as well as legal-/information based instruments.

Under this sub-category are found liability laws and performance bonds (which increase the financial cost of irresponsible waste handling or disposal); performance disclosure (in which information about the performance of a waste producer or handler affects its financial condition by affecting public standing); and general public education (to alter the demand for environmentally-improved waste management).

Creation or facilitation of markets is a measure relevant to all parts of the product and waste cycle. Policies to promote more competitive markets in waste management services, instead of the usual direct public administration of waste management, can alter the incentives for participation in the provision of the services; the incentives of the public to rely upon the services, and the fiscal condition of public authorities. Experience with tendering long-term contracts to private

service providers illustrates this type of economic instrument. Specific examples of non-revenue economic instruments used in solid waste management are provided below:

- Product life cycle assessment, which predicts overall environmental burden of products and can be used in certification programmes;
- Deposit-refund, deposit paid and refund given upon product return for reuse;
- Take-back systems, where manufacturers take back used products or packaging; Procurement preferences, evaluation criteria adding points for products with recycled content or reduced resource demand;
- Eco-labelling, which notes product's recyclable content and whether product is recyclable;
- Recycled content requirements, laws and procurement specifications noting the precise recycled content required;
- Product stewardship, which encourages product designs that reduce pollution, include the full cost of solid waste recycling and disposal, reduce wastes and encourage recycling;
- Disclosure requirement, in which waste generators are required to disclose their pollution;
- Manifest systems, precise cradle-to-grave tracking of hazardous wastes;
- Blacklists of polluters, published lists enable consumers to consider whether to buy from polluting companies;
- Liability insurance, liability assurances by contractors and private operators;
- Bonds and sureties, guarantees for performance by contractors and private operators;
- Performance-based management contracting where oversight contractors commit to overall service improvements; and
- Clean City competitions that reward neighbourhoods and cities that have improved cleanliness.

6.0 Lessons learnt from Economic Instruments in Solid Waste Management

Based on projects implemented by UNEP and its partners in south east Asian countries on solid waste management, a number of lessons have been emerging.

Most of these lessons deal with solid waste management in general, and there is a need to adopt these lessons specifically to the management of disaster debris.

<i>Lessons learnt</i>	<i>Implications for C&D² Debris</i>
First, a <u>policy</u> on the development and use of economic instruments and empowerment of government staff to seek opportunities for implementing new economic instruments are critical. National policy guidelines on cost recovery measures, moreover, reduce political risk for local officials.	<i>National and local policies on waste management need to take into account the potential debris that will be generated by a disaster event, such as a typhoon, earthquake or tsunami</i>
Second, building on what <u>already exists</u> (through review and improvement) should be the priority.	<i>A clear documentation of the situation and action taken to clear and process disaster debris should be recorded and good practices enhanced to facilitate replication in other situations, and incorporation in policies</i>
Third, <u>learning by doing</u> is the way forward since many instruments will not be perfectly designed. An imperfectly designed instrument may be subject to amendment, based on stakeholder feedback.	<i>Proper and inclusive stakeholder consultation and participation will help in identifying and implementing the appropriate economic instrument for C&D disaster debris</i>
Fourth, a <u>national committee</u> may be necessary to study and implement economic instruments. The committee can include diverse professionals including economists, engineers, lawyers, and environmental scientists (from	<i>Inclusion of disaster and rapid response professionals in the committee will ensure that issues related to C&D disaster debris are incorporated in the deliberations of such a committee.</i>

² C&D = construction and demolition

<p>ministries responsible for environment, land, finance, and others, and from the private sector) and can apply multi-disciplinary approaches to carry out the economic analysis and environmental assessment of each economic instrument option before choice is made.</p>	
<p>Fifth, in principle, user charges can <u>encourage waste minimization and proper waste management</u> throughout the product and waste cycle.</p>	<p><i>For C&D disaster debris, experience has shown that proper waste separation and recycling will greatly benefit environmentally sound waste management. Potential earmarking of user charges to handle C&D disaster debris will have to be explored.</i></p>
<p>Sixth, the use of <u>taxes at the disposal stage</u> to internalize the air, water and soil pollution effects of disposal has great potential but this requires that the municipalities have sufficient financial strength (which can be improved via better management of user charges) and stringent control of illegal dumping.</p>	<p><i>Experience has also shown that proper planning and designation of land area for processing of C&D disaster debris will have a positive impact on reducing illegal dumping of such wastes (as was observed in Banda Aceh).</i></p>
<p>Seventh, <u>revenue providing</u> economic instruments such as tax credits, low-interest credit lines, accelerated depreciation, and relief from custom duties can provide financial incentives for the private sector to invest in production changes that reduce hazardous substances, increase recyclability, generate less waste, and to participate in solid waste service delivery, including resource recovery.</p>	<p><i>The potential benefits of such action to reduce the risk/hazard risk of contamination and/or industrial accidents during a disaster event, such as a typhoon, earthquake or tsunami, will also have to be highlighted, in order to encourage wider participation and involvement.</i></p>
<p>Eighth, instruments that target areas of <u>significant pollution loading and environmental consequences</u> should</p>	<p><i>Besides the points mentioned above, the potential threat of environmental degradation leading to disasters themselves will also have to be</i></p>

receive priority.	<i>considered in identifying and using appropriate economic instruments.</i>
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Other design considerations include:

- Instruments that focus on long-term behaviour modification should be implemented.
- New instruments should be introduced in steps, gradually.
- Instruments should be in tune with broader economic development objectives in terms of use of labour, energy and capital.
- Consideration should be given to how revenues from economic instruments will be used.

7.0 Contextualizing Economic Instruments in the DEBRI Project³

The project - Demonstrating ESTs for Building waste Reduction in Indonesia (“DEBRI”) – was designed to demonstrate a waste management mechanism, which would first be applied to tsunami-generated debris and would subsequently be used for day-to-day construction/demolition waste in the rehabilitation/reconstruction efforts of the affected communities in Banda Aceh, Indonesia.

The project’s three key pillars are (a) technology support, (b) capacity building and (c) economic instruments. As a part of the project, innovative and appropriate Environmentally Sound Technologies (ESTs) for management of debris are identified and demonstration projects on reuse and recycling are carried out, along with training programmes for local and national stakeholders.

The economic instruments component forms an important part of the project. The project identifies economic barriers to active participation of target communities and local government agencies, and ensure broader local ownership. This component is carried out in close collaboration with local and national authorities.

³ Information on DEBRI Project can be found on the web at: <http://www.unep.or.jp/ietc/DEBRI/>

Extract from Executive Summary of Baseline Data Report

“ ... The current waste composition in Banda Aceh is mainly composed of organic wastes. However, C&D wastes arising from the tsunami disaster still remains intact. These C&D wastes are mixed, consisting of stone/brick, timber, vegetation, metals, soil/mud, and other types, but can be separated more easily than municipal solid wastes (MSW). Due to unpredictability of disasters events, the chances of contamination of C&D wastes are also high.

The adjusted total volume of C&D waste generated from destroyed building has been estimated to be around 853,930 m³ comprising of building super-structures (above ground) at 725,840 m³ and sub-structures/foundations at 128.090 m³.

There were no special technologies used to treat C&D wastes. The institutional capacity of local authorities in handling C&D wastes was quite limited. However, the existing infrastructure and experience of Banda Aceh's DKP (Cleansing Department) in handling MSW and post tsunami wastes may be a potential modality to develop integrated waste processing and reuse/recycling.”

- Report on Tsunami-generated Debris, September 2007

In order to carry out the above objectives, this component's activities will carry out the following activities:

- Provide a concise account of the nature, extent, and impact of the problem of C&D disaster debris;
- Identify key aspects of the problem (level of waste generation, trade, and disposal, among others) that the integrated policy package is designed to address;
- Discuss the short-list of EIs with project stakeholders (particularly the Ministry of Environment, Government of Indonesia) that can be considered for inclusion in a policy package, including its potential economic, social and

environmental impacts of implementation of the designed policy package.

The policy package will potentially explore the potential economic instruments in terms of the following principles:

1. Environmental effectiveness and benefits
2. Administrative costs and efficiency
3. Revenue generating potential
4. Ease of implementation and replicability
5. Acceptance of the instruments from key stakeholders at the national and local levels, including local communities
6. Short and medium term results
7. Economic development enhancement
8. Waste type applicability

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Annex I: Comparisons of Economic Instruments for Waste Management

Economic Instruemnt	Impact	Supporting Regulatory instruments
Direct Charging	Promotes waste minimisation, composting & recycling by penalising alternatives	<p>Mandatory recycling targets</p> <p>Mandatory provision of schemes</p> <p>Mandatory participation in recycling schemes</p> <p>Landfill Bans for specific waste streams</p> <p>Ban or charging for goods that produce the wastes</p>
Landfill Tax	Promotes diversion from landfill via any other option	<p>Mandatory Recycling targets to encourage diversion to recycling rather than treatment and energy recovery</p> <p>Landfill bans for specific waste streams</p>
Tradable landfill permits	Promotes minimisation, recycling or energy	Landfill Bans for certain materials

	recovery of the component or waste stream targeted by the permit	
Raw Materials (or Aggregates) Tax	Promotes waste prevention and waste recycling	Recovery targets/packaging regulations
Peat Tax	Promotes composting	Compost targets/mandatory collection of biodegradable waste
Product tax	Promotes waste prevention and minimisation	Landfill bans Diversion targets
Deposit refund schemes	Promotes waste minimisation, reuse and recycling	National Targets for waste diversion Landfill bans
Incineration tax	Promotes waste minimisation, reuse and recycling	Recycling targets Mandatory collection/schemes /participation
Waste Tax	Promotes diversion to options with lowest tax	Recycling targets Packaging Regulations
Voluntary agreements	Participation of concerned stakeholders in voluntarily reducing (or setting targets for) waste generated	Information campaigns Stakeholder consultations
Public information campaigns	Educating public in waste separation and disposal	Education programmes Stakeholder consultations
Cleaner Alternatives	Providing alternatives	National and local

(including technologies)	for activities that generate waste	laws providing for alternatives
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