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The Economy and Environment Program for Southeast Asia (EEPSEA) was established in May 1993 to support training and research in environmental and resource economics across its 10 member countries: Cambodia, China, Indonesia, Lao PDR, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand, and Vietnam. Its goal is to strengthen local capacity for the economic analysis of environmental problems so that researchers can provide sound advice to policymakers.

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Polluters Pay to Clean up the Bay: A Proposal from the Philippines

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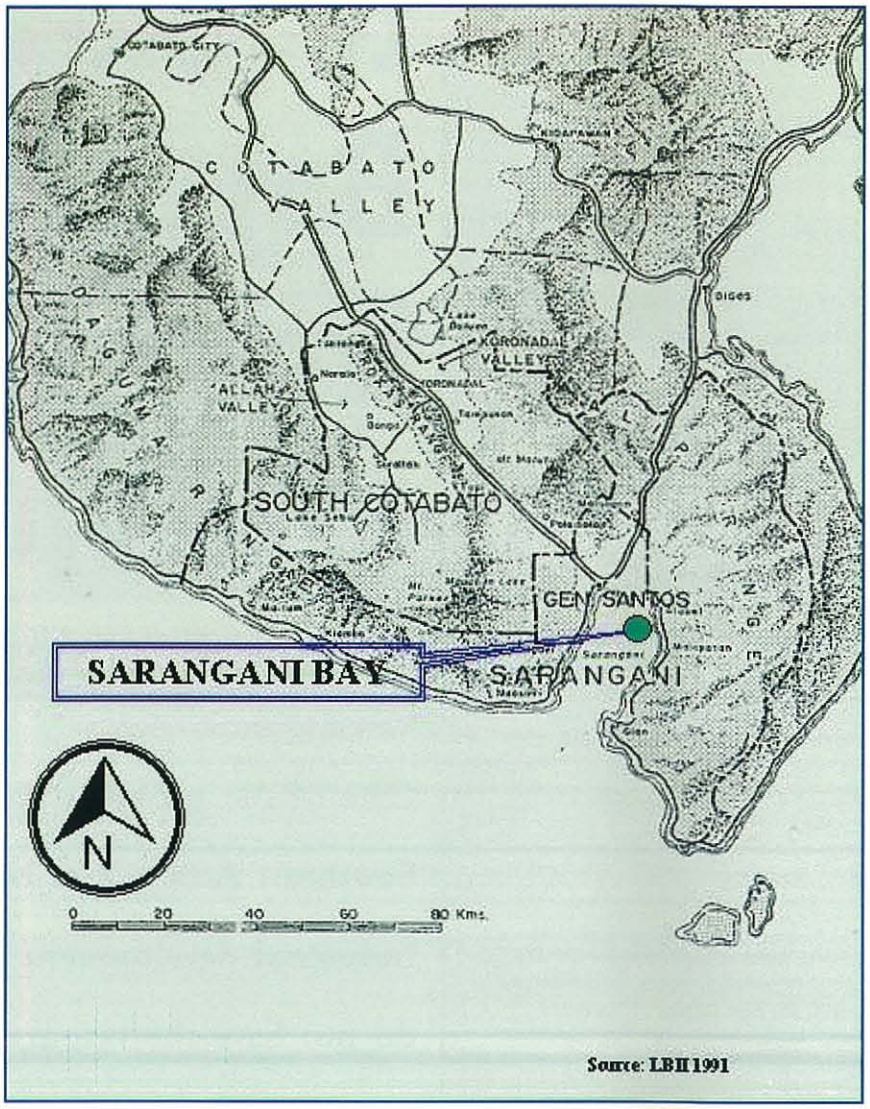
One of the problems facing most countries in Southeast Asia is how best to limit pollution as industrial development proceeds. Many countries do not have the resources to adequately enforce anti-pollution laws and in many places businesses are given little incentive to invest in cleaner production or pollution clean-up technology.

A new report from the Philippines shows that "making the polluter pay" by charging businesses to dispose of effluent could provide an effective incentive to reduce industrial pollution. →

A summary of EEPSEA Research Report 2003-RR4, An Effluent Charge for Sarangani Bay, Philippines: An Ex-ante Assessment by Anabeth L. Indab, Aireen I. Guzman and Ricardo T. Bagarinao.

An effluent charge will *er*

The report is by Anabeth L. Indab, Aireen I. Guzman and Ricardo T. Bagarinao, researchers at the Resources, Environment and Economics Center for Studies (REECS), in Quezon City. They looked at how best to control pollution in Sarangani Bay, one of the Philippines' most important coastal regions. In particular, the researchers worked out what level of effluent charge would best protect the bay's coastal waters from pollution, without imposing too great a burden on industry.



Location of Sarangani Bay

Sarangani Bay: Troubled waters

Sarangani Bay has an area of almost 450 sq km and is bounded by the province of the same name and General Santos City. As well as providing a sanctuary for marine life and being an important fishery area, the bay is also a draw for visitors, thanks to its white-sand beaches, beautiful coral reefs and scuba diving sites. From an industrial perspective, it is one of the Philippine's most strategically important ports and is slated for significant medium- and long-term development, particularly near General Santos City. Although there are localized pollution problems, in general, the water quality of Sarangani Bay is not yet at a critical level.

However, according to the researchers, the threats posed by current industrial growth make immediate action vital. This is particularly true because Sarangani province is becoming increasingly dependent on activities such as fishing, agriculture and eco-tourism that depend on clean seas and scenic beauty.

At present, water quality control is based on a national command and control (CAC) approach that aims to enforce ambient and effluent water quality standards through fines for non-compliance. The government's Department of Environment and Natural Resources (DENR) is in charge of monitoring the system, but is hampered by lack of manpower and other technical resources. To find a better way of organizing water quality control, the researchers decided to investigate the use of an effluent charge.

Why a charge?

One major advantage of such an economic instrument over a pure CAC scheme is that it can place a smaller overall financial burden on business. A CAC approach is often

courage cleaner development

costly to the economy because polluters with high abatement costs are required to do as much as those with lower costs. In comparison, an effluent charge system allows companies to choose how they react - either by investing in pollution clean-up if their abatement costs are low or by paying a charge if their abatement costs are high. This approach exploits the natural tendency of companies to pursue least-cost strategies and can therefore bring significant overall cost savings. The larger the difference in abatement costs between firms, the greater the overall savings. The challenge of such a system is, of course, to find the most effective level of charge. If effluent charges are set too low, industry has no inducement to reduce pollution; if they are set too high, they can invite political opposition or illegal dumping.

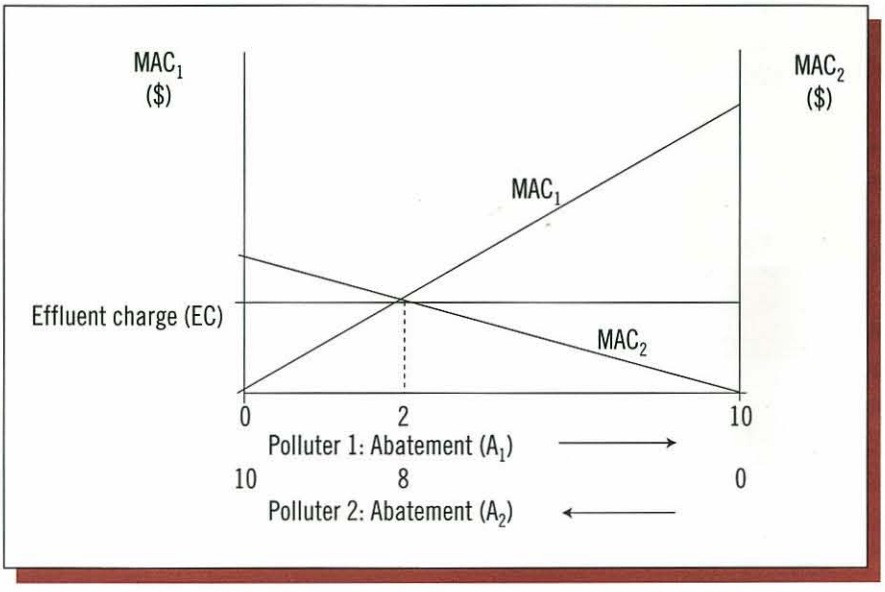
Setting pollution limits

The researchers started off by deciding what pollution target they should aim for. Sarangani Bay is currently classified as Class SA and the discharge of waste or effluent is absolutely prohibited. However, given its actual and projected uses, an SB classification (under which a certain level of discharge can be allowed) is a more realistic option. Because of this, the researchers decided to aim for the Class SB BOD5 ambient standard requirement of 50mg/l. Taking into account the hydrology of the bay and using a deterministic water quality assessment model, the researchers calculated the BOD5 discharge that would keep water quality within this limit. Their results showed that Sarangani Bay could assimilate as much as 19,134 tonnes of BOD5 annually.

The researchers then investigated how this level of discharge could be attained. Using figures from previous studies, they found that about 25,248 tonnes of BOD5 are being discharged annually into Sarangani Bay. 71% of this comes from agricultural, domestic and other non-industrial sources, and 29% from industrial sources. These findings gave an annual pollution reduction target of some 6,114 tonnes of BOD5. This, the researchers argued, could be achieved if the major polluting industries in the region cut their emissions by 92%.

Calculating clean-up costs

To calculate the effluent charge that would bring about this level of reduction, the researchers first looked at the cost of pollution treatment, basing their calculations on the costs of end-of-pipe treatment. A review of the industries polluting the bay showed that they were dominated by a few agro-based industrial sectors such as tuna and fruit canning, livestock and other food manufacturing industries. Specifically, the researchers found 68 establishments in 12 sectors that could be classified as major polluters. Data on these 68 companies were generated from actual plant-level figures or through a cost-transfer approach using data from surveys conducted by the Asian Development Bank and others. The researchers found wide variations in pollution marginal abatement costs (MACs) across the full range of polluters, with costs varying from 1.63 to 68.52 PHP/kg of BOD. However, the cost range for the



Effect of an Emission Charge

firms that account for the bulk of the pollution was much smaller.

The researchers then looked at each of the main polluting plants to find out their effluent emissions and other relevant information. From these they calculated the total abatement cost per plant given different levels of effluent charges. These calculations were based on the assumption that plants would adopt the least-cost combination of investment in pollution abatement technology and payment of effluent charges.

They found that a BOD effluent charge of PHP 6/kg would be enough to bring about the 92% reduction in pollution needed to meet the Class SB ambient standard. They calculated that the total abatement cost given this level of effluent charge would be PHP 671 million.

Does the charge give good value?

To find out how cost-effective this approach would be, the researchers calculated how much it would cost to achieve the same level of industrial pollution reduction under a CAC scheme. They found that the total abatement cost would amount to approximately PHP 685 million. This means that, given the specified targets and charges, an effluent charge would be PHP 14 million (2%) cheaper than the current CAC scheme. This amounts to about USD 265,000 per year.

Although the cost difference between CAC and an effluent charge seems small, the researchers still recommend that the economic instrument would be the better choice. PHP 14 million goes a long way in the Philippines. They also argue that strong economic growth in the bay area and especially around General Santos City will lead to an inevitable increase in pollution in the future unless it is checked in some way. The current CAC scheme gives little incentive for investment in pollution abatement and is under-financed and so under-enforced. In comparison, the researchers argued, an effluent charge would encourage future development to be cleaner.

Exchange rate:
53 PHP = 1 USD (November, 2002)

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