Sustainable Use of Natural Resources in the Context of Trade Liberalization and Export Growth in Indonesia:

A Study on the Use of Economic Instruments in the Pulp and Paper Industry[1]

Abstract

This report summarizes a number of economic instruments that have been implemented in the industrial sector with relevance to the pulp and paper industry. Findings indicate that economic instruments do tend to have specific purposes and have a strong potential to reduce the environmental impact identified. The report then proposes a framework for implementing a national effluent charge in the pulp and paper industry and presents a preliminary work plan for achieving this. An effluent charge is a viable option to implement in Indonesia since many of the conditions required to implement such an economic instrument programme are already in place. However, the proposal will have broad implications for the institutions responsible for implementing and enforcing it.

Finally, the report clearly indicates that further research on environmental management strategies is needed to provide sound guidance to decision makers and industry stakeholders to establish new policies and select appropriate instruments for environmental protection and sustainable development of the pulp and paper industry. It is hoped that this report will provide a useful basis from which to continue the research and develop in-depth studies in the future.

1. Introduction and background

After three decades of continuous growth fostered by political, social, and macroeconomic stability, the Asian economic crisis of 1997 catalyzed a major change in Indonesia's economic and political system. The crisis and the subsequent fall in GDP, the largest among ASEAN (Association of South East Asian Nations) countries, exposed the underlying weaknesses in Indonesia's economic and financial structures, prompting calls for reform. Subsequently, Indonesia developed a programme aimed at stabilizing the economy, restructuring its ailing banking system, and creating the conditions conducive to a more efficient, market-based allocation of resources in several key sectors.

1.1 Indonesia's industrial sector

In Indonesia's economic growth oriented paradigm of the 1980s - 1990s, natural resources and the environment were treated as free goods. This approach has led to a negative situation in which natural resources are over used and environmental services under valued, and the environmental and social costs are not internalized into production costs.

Expansion of industrial activity also increased the amount of industrial waste generated. Consequently, environmental management measures must now be put in place to solve the environmental problems associated with growth of industrial activities, including waste treatment techniques.

The perception that natural resources are free also creates high social costs, as well as inequities for the people who are not directly benefiting from use of those natural resources. For these reasons and to produce development that can be sustained for the long run, the government therefore needs to design sustainable development policies and policies that internalize the costs of pollution and environmental damage into production costs.

1.2 Environmental issues in Indonesia

Issues of environmental quality and sustainability are recent additions to government development concerns. Development policies tended formerly to be based on economic growth rather than on sustainable development. It is now widely recognized that much pollution and environmental damage has been caused by the failure to include and integrate environmental wisdom into development plans and processes. Over the last five years, there have been many changes in development policy.

These transitions will have major implications for the environment. The analysis of current environmental conditions and trends, and the likely impact of future growth and development under existing policies and practices, leads to three main conclusions. First, future growth and development, including the process of industrialization, will depend increasingly on Indonesia's stock of key natural resources (land, forest, water, and energy) and the sustainability of critical ecosystems (including groundwater aquifers in urban areas, and watersheds and coastal and marine ecosystems throughout Indonesia). Second, industrial sector growth will continue to be concentrated in urban areas, especially on Java. Industrial pollution, combined with pollution from urban sources (human waste, solid waste and vehicle emissions), poses an immediate and significant threat to health and human welfare. Third, as a result of rapid economic growth, conflicts over the use of land (i.e., forests, since it directly relates to the present study) and access to other natural resources are increasing.

In order to support the sustainable use of natural resources, the Government of

Indonesia has developed policies and laws that promote the use of economic instruments. Once implemented, most sectors will be required to use economic instruments as a tool to internalize environmental and social externalities.

2. Impacts of trade liberalization in Indonesia

Trade liberalization can have both positive and negative impacts on the environment and the economy. As a member of WTO (since 1947 as a colony of the Netherlands), Indonesia has had to adjust its trade-related policies in the era of trade liberalization.

2.1 Trade liberalization and economic growth

Trade and foreign investment were at the heart of Indonesia's economic reform policy during the 1990s, but from 1994 - 1996, the pace of trade and investment slowed somewhat, compared with previous years. In the face of the economic crisis, however, the Government undertook to accelerate the pace of reforms and to remove many remaining restrictions on domestic and international trade. Certainly, as Indonesia seeks to improve the performance of its economy and address poverty, the environment will be an important concern.

2.2 Environmental impacts of trade liberalization

Rapid growth of Indonesia's industrial sector to support economic and trade activities has serious worldwide environmental implications. Increased exploitation of natural resources including high consumption of water and accelerated forest conversion, increased generation of energy and deterioration of other resources, as well as increased levels of pollution, are examples of environmental problems happening worldwide.

There are many ways of assessing environmental and sustainable development effects of trade policies and trade liberalization. One of the most commonly used approaches in Indonesia is based on the environmental assessment methodology of the OECD, which has been further developed by other practitioners of assessment, including UNEP. Table 1 below summarizes the result of a preliminary assessment relating to the pulp and paper industry.

Table 1 Preliminary assessment of the impacts resulting from trade liberalization and export growth in the pulp and paper industry

Trade-related effects	Impact on forest resources	Impact on bio diversity	Impact on water use	Impact on energy use	Impact on aquatic resources	Impact on surface & ground water	Impact on acid rain	Impact on health & safety
Product effects	(0)	(0)	(0)	(0)	(-)	(-)	(0)	(0)
Technology effects	(++)	(++)	(+++)	(++)	(+++)	(++)	(++)	(+++)
Scale effects	(---)	(---)	(---)	(--)	(--)	(--)	(--)	(--)
Structural effects	(--)	(--)	(--)	(--)	(--)	(--)	(-)	(-)
Regulatory effects	(++)	(++)	(0)	(0)	(++)	(++)	(++)	(++)

Source: Adapted from UNEP (2001)

Note: (0) = No Significant impact

(-) = Light Negative impact; (- -) = Moderate; (- - -) = Significant Negative Impact

(+) = Light Positive impact; (+ +)= Moderate; (+++) = Significant Positive Impact

These preliminary impacts may be mitigated when efficiency is improved, or when industry growth allows for greater investments in environmental projects.

Expansion of pulp and paper production could also have negative environmental impacts when the use of natural resources is inefficient and there is minimum investment in environmental management. In this situation, pulp and paper production will be associated with increase in environmental degradation and pollution and severe impacts on health and safety. The environmental impacts are (1) deterioration of forest resources and loss of biodiversity, (2) water and air pollution, (3) surface and ground water resources.

2.3 Prospects for economic growth

Pulp and paper industries compete continuously between themselves and indirectly through the use of technology. Thus the pulp and paper industry needs to (1) encourage innovation of technology to survive and develop, (2) guarantee availability of basic materials, (3) strengthen community development through improved forest management programmes, (4) reform trade that may have impacts on environmental regulation and standards.

2.4 Opportunities and challenges

Indonesia's comparative advantages are (1) Indonesia still has a considerable

area for further development of industrial or plantation forestry (HTI), (2) Indonesia's HTI timber can be harvested after 7-8 years, while in 'Norscan' countries timber for pulp needs 30 years before harvesting. With appropriate use of technology and good management systems, these comparative advantages can deliver competitive advantages. While the competitive issues include (1) bilateral and regional agreements and the WTO, (2) imported paper and 'dumping', (3) eco-labelling and EMS ISO-14001 Series, (4) environmental sustainability.

3. Indonesia's pulp and paper industry

In 1997, of the world's 30 largest paper and pulp producing countries, Indonesia ranked 12th and 13th respectively. According to the Indonesian Pulp and Paper Association (2003), total installed capacity of pulp industries was about 6.08 million tons of pulp annually and in 2002 actual production was about 4.97 million tons. There are 77 paper production mills (10 mills are integrated pulp and paper) with a total installed capacity of about 10.06 million tons of paper annually. In 2002 actual paper production was about 7.21 million tons.

Indonesia's Government encourages the industry to use logs from land clearing for land preparation to reduce or avoid forest fires and optimize government expenditures (such as the Reforestation Fund and the Forest Resource Fee). Ultimately the pulp industry will use logs from 100 per cent HTI – both to produce a better product and to reduce dependency on the available mixed woods. In the future, the pulp and paper industry will be developed as a priority sub-sector of the forestry sector and development of the pulp and paper industry will be encouraged. Three key aspects of development will need to be considered: expansion, equitable distribution, and environmental sustainability.

4. Review of Indonesia's current environmental policies

There are three main approaches that can be used to manage environmental problems: 1) command and control policies (CACs), 2) voluntary approaches and 3) economic instruments (EIs). These approaches attempt to shift the costs and responsibilities associated with pollution or use of natural resources back onto the polluter or the user (*the polluter pays principle*). However, in practice, no single approach is implemented, a combination of the approaches is generally applied.

In 1997, Act Number 23 regarding Environmental Management introduced a new paradigm in environmental management and replaced the earlier law. Besides, some of Indonesia's national environmental policies, regulations and also voluntary approaches are also relevant to pulp and paper production, such as Act No. 41 of 1999 (Forestry Management), Government Regulation No. 18/1999 (Hazardous Waste Management), Eco-labelling, and Cleaner Production.

This new Act gives more attention to policies that use Market Based Instruments (MBIs) rather than Command and Control (CAC) only. To achieve better synergies between CAC policy and MBIs, partnerships among stakeholders and greater public involvement is being encouraged.

A number of market-based policies have already been adopted in several sectors with some positive indirect impacts. However, market based approaches have made only modest inroad into national environmental policies. The complementary nature of command and control and market-based approaches or economic instruments needs to be better understood and then turned into better policy making. Policy approaches are rarely comprised of only a single tool.

In the pulp and paper industry there is currently no specific use of economic instruments, although they have been used in the upstream activities that supply raw materials for the industry. For example, a forest taxation system has been in use for many years. The total burden of forest taxation are (1) Forest Concession License Fee (IHPHP), (2) Land and Building tax (PBB), (3) Reforestation Fund (Dana Reboisasi or DR), (4) Royalty (IHH), (5) Scaling and Grading Fee (BPHH), (6) Sawn Timber Export Tax, (7) Forest and Forest-related Levies. The effectiveness of existing Environmental Instruments for sustainable management are summarized in Table 2 below.

Table 2 Other EIs used in the forestry sector

ECONOMIC INSTRUMENT	INSTITUTION	INSTRUMENT ANALYSIS	
		STRENGTHS	WEAKNESSES
Interest free loan	Ministry of Forestry	To encourage P&P industry to develop HTI to fulfill raw material supply that is not from natural forest	The procedure for disbursement is not timely
Reforestation Fund / Performance Bond	Ministry of Forestry	There is a guarantee on reforestation to promote sustainability Long experience with its use; effective use requires close field monitoring to make sure that the forest rehabilitated	Complicated bureaucracy & fund administration Not all of the fund is used for correct allocation, which cause the rate of reforestation to be low
Tax exemption on wood from land clearing	Ministry of Forestry	To push P&P industries to utilize waste from IPK (land clearing) to prevent the degradation of natural forests	Low enforcement on applying HTI that can create pressure for wood from natural forests

Source: Authors' elaboration, 2003

Other economic instruments that can be applied to the main cycle of the pulp and paper production process include environmental soft loans, import duty exemptions on environmentally sound technology, user fees and user charges. Environmental soft loan is purposed to invest in pollution prevention and pollution control equipment, to improve of production efficiency, and as technical advisory services (for small and medium enterprises). Therefore, the objective of its loan is thus to improve environmental quality by reducing pollution loads through investment in technology. The strength of this loans' scheme is that funding is made available to promote environmentally friendly technologies. However, the weaknesses include limited fund availability, limited number of handling Banks, and complex bureaucracy making some industries hesitate to apply.

The import duty exemption for pollution control equipment is a fiscal instrument. The Ministry of Finance declared Ministerial Decree no: 36/KMK/05/1997 for free import duty on equipment and materials that are used for preventing environmental pollution. This instrument has been applied not only for the pulp and paper industry, but also for other industries. The strength of this exemption that the free duty encourages pulp industry to install waste treatment prevents further pollution, while the weaknesses could be mentioned that there is no guarantee to operate waste treatment equipment and operation and maintenance cost is expensive that makes the industries hesitate to operate it.

User fees for sustainable management of surface are imposed by the Perum Jasa Tirta (Water Service Company) and deep well water tax for ground water resources by Ministry of Energy and Minerals Resources. The main weakness of the instrument is that the tariff is too low, so it is not an effective control over the efficient use of resources. In addition, there is no guarantee that the revenue from the tariff from the tariffs will be reinvested (no earmarked system) in managing water resources.

Effluent or emission charges have a revenue raising function related to the costs of treatment, collection and disposal, and the recovery of administrative costs depending on the situation in which they are applied. They are not directly related to damage costs in the environment (Turner *et al*, 1994).

Table 3 below summarizes some of the EIs that have been implemented in the industrial sector in terms of the three main environmental impacts identified in pulp and paper production – forest degradation, air and water pollution and demand for water resources.

Table 3 Economic instruments applicable to the pulp and paper industry

Economic Instrument	Environmental Impact			Purposes	Advantages	Disadvantages
	forest degradation	air & water pollution	surface & ground water resources			
Charge Systems						
Effluent charges		XX	X	used on production processes, waste treatment	raises revenue, encourages polluters to reduce discharge, encourages innovation in clean technology, promotes cost saving strategies	involves complex implementation & high monitoring costs encourages illegal disposal without effective enforcement, over use of water
User charges		X	XX	used according to value & quantity of resources, (surface & ground water)	raises revenue, encourages efficient use of resources	involves high enforcement cost
Fiscal Instruments						
Import tariffs exemption		XX	X	free import tariff/duty on waste treatment equipment, waste paper, imported pulp	provides incentive to control pollution & manage waste, low monitoring costs, promotes innovation in control technology	imposes management costs on private sectors, may create incentive for counterfeiting

Reforestation Fund				to encourage reforestation and generate funds for environmental loans (for HTI forestry)	raises revenue (In 1993 accounted for almost two thirds of total forest tax)	easy target for raiding by non-forestry interests
Financial Instruments						
Soft loans & grants		XX	X	to encourage clean production	provides incentive for implementation of CP system & pollution control technology	
Performance Bond /	XX			used on HTI operations to maintain forest sustainability	encourages environmental restoration	has limited application & experience
Reforestation Fund	X					

Note: X = suitable applied XX= most suitable applied
Source: Author's elaboration (2003)

5. Policy proposal

In order to identify an appropriate type of economic instrument for specific use in a specific sector, it is necessary to determine whether it is possible to design a measure that will also meet all the other relevant criteria. For example, a tax must meet the criteria set out in the Statement of Intent and similar criteria will apply to other economic instrument schemes. However, while the ideal economic instrument will tackle the environmental problem identified, this is often not possible to achieve directly and proxies may need to be used.

There are three basic components that are needed to build an economic instruments programme for wastewater management: the data provided in the permits issued, monitoring of pollutant loadings, and application of the charge. Presented below (Table 5) is an outline of what needs to be addressed in the development of an effluent charge programme. Since this type of system is broad-based and as such will involve multiple government and private sector stakeholders, the institutional arrangements will need to be determined at the beginning of the development process. The legal

basis for the charge system will also be of great importance and as such will require attention early in the development process.

Table 6 Work Plan for development of a National Effluent Charge

Task	Programme Component	Comment
1	Governmental stakeholder	• Identify potential departments and agencies involved in the development of an environment charge system where government revenue is collected. • Develop technical team responsible for the overall direction of the programme. • Assign institutional responsibilities and job descriptions for the programme.
2	Identification of scope of programme (ecosystem or sectoral)	• Determine priority polluting industry or priority river/section. • Identify scale of industry-small, medium, large.
3	Gather information about location/industry/ loading	• Pollutant loading information for waste water parameters (BOD, COD,TSS). • Type, if any, of waste water treatment facilities. • Type and volume of production, water needs for production.
4	Waste water standard	• Compare industry loading relative to standard or assumed acceptable level of pollutant loading (i.e., average 200 mg/l BOD).
5	Discharge Permit	• Identify type of permit being used in region. • Determine if information requirements are already included in permit. • Determine if an addition to the permit is needed to gain information about industry or make them subject to self- monitoring requirements.
6	Legal basis	• Investigate the legal basis for the programme and identify potential threats to the application of charge. • Identify areas that must be addressed for the implementation of an emission charge.
7	Determine calculation to be used	• Compare models of charge calculation. • Determine what waste water parameter is to be used in the calculation. • Select model to apply charge.
8	Link to pollution control programmes	• Clean Rivers Programme (PROKASIH) and Business Environmental Performance Rating Programme (PROPER)
9	Monitor funds	• Arrange the institutions whose manage /monitor the funds (eg.: Badan Pengawasan Daerah (Regional Audit Body) • Identify the uses of funds and its mechanism

Source: Authors' elaboration, 2003

6. Summary and conclusions

A number of key issues have been raised by the report. Firstly, Indonesia's policy of industrialization and future growth depends heavily on exploitation of natural resources and environmental services (land, forest, water, energy). Secondly, current environment policies based on the CAC and voluntary approach are generally weak, poorly enforced and susceptible to misuse. Thirdly, as a result of economic growth, industrial pollution poses an immediate and significant threat to health and human welfare, creating a major problem that requires urgent attention. Finally, for economic growth to be sustainable, the costs of pollution and environmental damage must be internalized into the costs of production and consumption as a matter of national policy, and decision makers need to take a proactive role in formulating a wide range of economic policy instruments to achieve the sustainable use of natural resources. The National Effluent Charge as proposed in this report is a good first step but it requires further development, a detailed action plan for implementation and suggestions for follow-up.

References

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