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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 9 member countries: Cambodia, China, Indonesia, Laos, Malaysia, Papua New Guinea, the Philippines, Thailand, and Viet Nam. 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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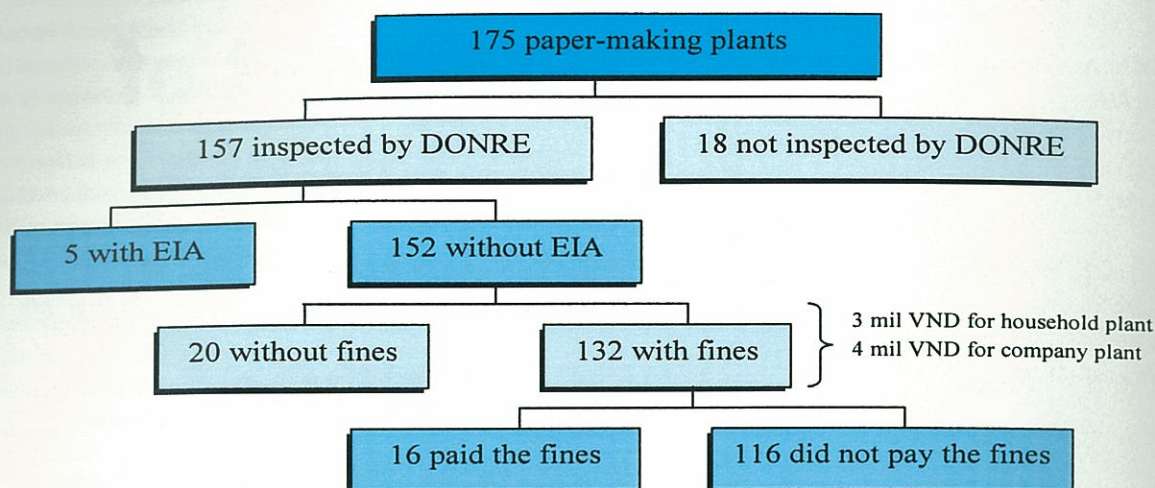
Paper-making and Pollution – An Assessment of Environmental Performance and Improvement Options in Vietnam

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The paper-making industry in Vietnam is the cause of significant environmental pollution that is affecting the country's wildlife and the health and livelihoods of its people. A new EEPSEA study has investigated this problem in one of the country's provinces where paper-making is an important industry. It finds that there is a lack of awareness about the environmental →

A summary of EEPSEA research report, 2008-RR9, 'Compliance of Paper-Making Plants with Environmental Regulations in Bac Ninh Province, Vietnam' by Dr. Nguyen Mau Dung, Department of Economics, Hanoi University of Agriculture, Gia Lam District, Hanoi City, Vietnam.
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"many paper-making plants do not



Compliance of paper-making plants with EIA report submission regulations

→ impact of the paper-making industry. It also finds that there are many paper-making plants in the province that do not comply with the country's environmental regulations and that do not have the necessary pollution clean-up technology available.

This study, which was carried out by Nguyen Mau Dung from Hanoi University of Agriculture, assesses the paper-making plants in Phong Khe Commune of Bac Ninh Province. It recommends a number of key steps that must be taken to improve the environmental performance of the paper-making plants in the area. These include securing the necessary resources to set up pollution treatment systems that could be shared by groups of plants and strengthening the monitoring and enforcement of environmental legislation. It also recommends that more must be done to raise awareness on the need for environmental protection among the general population and the plant owners in the province.

Bac Ninh – a Centre for Paper-making

Bac Ninh Province is located in the centre of the Red River Delta, Vietnam, next to Hanoi City. It lies within the Northern Key Economic Zone, where the economic growth rate has been high. Between 1996 and 2005, the region's GDP growth rates were stable at around 13.5%. This was much higher than the national GDP growth rate. Paper-making is a key part of the province's economy. Thanks to it, many jobs have been generated and people's incomes have been significantly improved. Phong Khe currently has 175 paper-making plants producing different types of paper, including votive paper, kraft paper, wrapping paper, and tissue and toilet paper. These are distributed throughout Vietnam.

The paper-making industry in Bac Ninh is also important to the economy of the country as a whole. As of 2005, paper-making in Bac Ninh accounted for 16.42% of total paper products in the whole country and generated permanent employment for more than 3,000 people. In 2006, Phong Khe

Commune's paper industry produced 150,000 tonnes of products. This provided revenue of 540 billion VND (around 36 million USD) and contributed about 13 billion VND to the national budget through taxes.

Paper-making's Environment Impact

Despite its economic importance, paper-making in Bac Ninh Province creates a range of significant environmental problems. As the paper production lines in the commune are quite old, many paper plants do not have up-to-date pollution clean-up technology and discharge huge volumes of heavily-polluted wastewater. This effluent affects the water in all the commune's canals and is the main reason why the Ngu Huyen Khe River, which flows through Bac Ninh Province, is known as the "Dead River". The Province's paper-making plants also produce great amounts of air pollution, primarily because they burn a lot of coal. As a result, the atmosphere in Phong Khe Commune is smelly and filled with dust and coal smoke.

The pollution in the commune has

comply with environmental regulations.”

negative impacts on the health of its people and its agricultural production. There has been an increase in the incidence of various respiratory and skin diseases and a significant area of land is no longer suitable for cultivation. The serious pollution in the commune has been highlighted many times by local and national newspapers and other publications. To try and combat the problem, environmental regulations have been issued and implemented. All paper-making plants in the commune are required to submit their EIA reports for assessment, pay their wastewater charges and establish a wastewater treatment system. However, it is clear that these measures are not working and that many plants have not complied with the law and are continuing to pollute their surroundings.

Investigating Environmental Performance and Compliance

Nguyen Mau Dung's study was designed to provide an overview of the environmental compliance of paper-making plants in Bac Ninh Province and to come up with recommendations to mitigate pollution in the area. To do this, Dung investigated the environmental performance of a sample of paper-making plants in the area. He

looked at how much it was currently costing plants to comply with environmental legislation and analyzed the factors affecting their compliance. The analysis of compliance costs focused on those costs that increased (or the benefits that decreased) when paper-making plants complied with environmental regulations. Thus, the compliance costs included the cost of establishing and operating a wastewater treatment system to meet relevant standards, wastewater fees and any other environmental fees that paper-making plants had to pay.

Primary information on paper-making activities, environmental compliance and other related issues was collected through direct interviews with 62 plant owners and through focus group discussions with all key players – from local residents to plant owners. The opinions of different stakeholders on what should be done about environmental compliance and pollution mitigation were also sought. Secondary data on environmental regulations, the paper-making industry, and environmental problems in Phong Khe Commune were gathered from key agencies. The research focused mainly on the plants in Phong Khe Commune. These were chosen as a representative sample of the paper-making industry in Bac Ninh

Province.

Poor Performance and Compromised Compliance

More than 60% of the plants in Phong Khe Commune were ranked as serious polluters. Many paper-making plants had not complied with the current environmental regulations. Around 90% of the paper plants had still not submitted their EIA reports, 50.9% had not paid their wastewater charges and 94.9% had not established wastewater treatment systems as required. Fines had been imposed on non-complying plants, but only a few plants had paid the fines; most had not.

A comparison was made between the amounts of money that plants were paying as fines compared to the amount of money they would have spent had they complied with relevant environmental legislation. It was clear that most plants' pollution-related costs were very small compared with the full cost of compliance to legislation. For example, while the full cost of submitting an EIA report was between 20-35 million VND, the fine for not submitting such a report was only 3-4 million VND. Moreover, the average wastewater fee paid was just 0.43 million VND, however, the full charge for each plant should have been 2.06 million VND. This points to

	No. of plants	Current costs incurred	Full costs of compliance
Plants which have submitted their EIA reports	19	20-35 mil VND	20-35 mil VND
Plants which have not submitted their EIA reports	156	0 mil VND for EIA writing; 3-4 mil VND for fines (16 plants)	20-35 mil VND

Source: FGDs (2007)

Current costs versus full costs of compliance with EIA report submission regulations

the conclusion that penalties for non-compliance are not adequate.

When the factors affecting the compliance of the plants were assessed it was found that a plant's type, location, scale and products were all important. Plants located inside the commune's industrial zone were found to comply better with the regulations than those outside it. The plants producing kraft and wrapping paper also complied better with the regulations than those making votive or toilet paper. The main reasons why the plants did not comply with regulations included: plant owners' inadequate understanding of environmental regulations; a lack of financial resources; limited space for treatment system installation; small fines; and the limited capacity of the local environment authorities to enforce regulations.

Better Treatment Systems Needed

More than half the paper-making plants in Phong Khe are still located in residential areas. Based on the study findings, it is clear that moving these plants to industrial clusters and building more industrial zones will help mitigate pollution. It is also clear that wastewater treatment needs to be improved.

There are two possible options for wastewater treatment: establishing individual treatment systems and establishing treatment systems for groups of plants located close to one

another. An assessment of these two options was made, taking into account the views of the main stakeholders in the commune. The results showed that the later option is the best. This is because it offers a lower treatment cost per cubic meter of wastewater, would be more practical to set up, would be more likely to get financial support and would be more culturally acceptable.

However, the initial investment costs for such treatment systems are significant and beyond the capacity of the paper-making plants (although the plant's management teams indicated that they would be willing to contribute a part of their earnings). Financial support is therefore necessary. This could come from the Vietnamese government or foreign sponsors. To get this important initiative off the ground, the study recommends that Bac Ninh Department of Natural Resources and Environment, in consultation with technical experts, design the communal waste treatment plant and subject this to cost-benefit analysis. This study, if favorable, can then be used to get donor funding for the project.

Better Understanding and Enforcement

The study also found that although the people in Phong Khe Commune perceive wastewater and solid waste as environmental health hazards that need to be addressed, their awareness of environmental protection is still low. In addition,

many plant owners do not pay any attention to the contents of EIA reports and do not understand the value of submitting the reports or of paying wastewater charges. They usually do not voluntarily comply with environmental regulations. Raising the awareness of environmental protection among both villagers and plant owners is therefore very necessary. The study recommends that environmental education programs should be set up and implemented. Information on the negative effects of environmental pollution on human health should be disseminated and training on pollution prevention and treatment should also be given to plant owners and staff.

One of the other key reasons for the non-compliance of the paper-making plants in the province is weak monitoring and enforcement by the local environmental authorities. The study therefore recommends that the number of environmental staff involved in this work, both at the provincial and district level, should be increased. It suggests that each village should have one staff member specializing in environmental management, who has adequate knowledge and experience in the field. It is felt that strengthening monitoring and enforcement capabilities in this way, when linked with the other proposals put forward in the study, should go a long way to addressing the pollution problem caused by paper-making in the commune and province and beyond.

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