The environment in times of crisis

Asia and donors after the 1997 financial crisis

By Peter Dauvergne

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Executive summary

This report examines the environmental implications of the Asian financial crisis in Indonesia, the Philippines, Thailand, Indochina and Melanesia, paying particular attention to the implications of these findings for Official Development Assistance (ODA) donors. It covers the period from mid-1997 until early 1999, concentrating on environmental changes related to forestry, fisheries, mining, agriculture, water and air pollution, and conservation. It examines the implications for natural resource management, large infrastructure and development projects, corporate activities, state environment budgets and services, and implementation.

Numerous studies were completed in 1998 on the causes of the financial crisis. A lesser, although still substantial, number were done on the social effects. Yet, comparatively little research was conducted on the environmental implications. This report is partially designed to fill this research gap. More specifically it is intended to assist donors in assessing and responding effectively to the environmental implications of the Asian financial crisis. The scope of the study is purposively broad and comparative to give donors an overarching picture of the environmental changes now occurring in the Asia-Pacific. This study does not aim to provide a definitive statement on the environmental implications of the crisis, but instead is designed to trigger debate and lay a foundation for further research.

There are both immediate and long-term positive and negative environmental implications of the Asian crisis. The crisis has exacerbated as well as created new environmental problems. Resulting environmental degradation could well feed back and aggravate economic and social problems, creating a downward spiral that would be hard to reverse. At the same time, however, political, administrative, and financial reforms now sweeping the Asia-Pacific have opened potential windows of opportunity to improve environmental management, both in the short and long terms.

The crisis is also contributing to important shifts in the underlying processes behind environmental change as well as the relative environmental costs for different groups. Some areas and groups are experiencing greater environmental hardships, while others are experiencing fewer, at least in the immediate term. Urban and rural poor are especially vulnerable and so far have absorbed a disproportionate amount of the environmental costs of the crisis.

The conclusions, implications for aid projects, and recommendations to help donors more effectively address environmental issues in the post-crisis period are divided into the following broad categories:

- stability and cycles of decline;
- industrial output and the environment;
- currency devaluations, commodity exports, and the environment;
- donor support for environmental projects,

nongovernmental organisations, and regional cooperation;
- support for monitoring, enforcement, and market/community incentives;
- and further research.

Stability and cycles of decline

Stabilising the economies within the region is essential to sustain an effective program of improving environmental conditions. Otherwise, environmental reforms will not receive adequate government and business support.

Yet restarting economic growth must not occur at the expense of the environment. Ignoring the environmental implications could trigger a second crisis—one centred on environmental collapse. Preventing a downward spiral will involve tackling economic, social, and environmental declines simultaneously. These are all inescapably intertwined. Donors should reject the argument that countries need to wait until they can financially afford to address environmental problems. It is also important for donors to search for, and support efforts to take advantage of, any opportunities to promote better environmental management in the region.

Industrial output and the environment

In the short-term, decreases in industrial output and real incomes appear to be slowing the rate of air pollution. Yet air pollution will likely deteriorate in the longer term as factories lower standards, evade regulations, and avoid investments in new and cleaner technologies. Especially sharp increases in emissions from small sources—such as houses and traffic—suggests the need for donors to support projects that reduce pollution from small sources, particularly in urban areas.

Early evidence suggests that the crisis has worsened water quality in the immediate term. Shakeb Afsah's research shows that despite the falls in industrial output, the amount of organic waste per unit of waste effluent has increased significantly in some areas of Indonesia. This has apparently resulted from more firms dumping untreated waste, partly to save money, and partly because of weaker enforcement. This challenges the common assumption that falls in industrial output lead automatically to lower levels of industrial pollution. These findings point to the need for donor assistance to support stronger enforcement of environmental regulations.

Currency devaluations, commodity exports, and the environment

Rapid currency devaluations have generated strong incentives for governments and firms in Asia to increase agricultural and natural resource exports. Particularly powerful incentives arise when production or extraction costs are mainly in local terms while profits are in foreign currencies (commonly US dollars). This is contributing to strong incentives and ambitious plans to expand exports of plantation products (especially palm oil), as well as resources such as fish, minerals, shrimp, and coffee. Although a shortage of capital in the region has constrained somewhat the rapid expansion of export-oriented natural resource projects, as the economies rebound this could greatly increase the environmental stresses on land, forest, and water resources. Migration of urban poor and unemployed to the countryside will put even greater pressures on rural environments as these people struggle to survive (often without detailed knowledge of local environmental conditions). Plantation and resource exports are certainly an important source of potential jobs and foreign exchange; but governments need to maintain a balanced and moderate approach to avoid overloading ecosystems. Governments and communities will need assistance from donors to manage the complex, interlinked environmental implications that will accompany moves toward large-scale

agricultural and natural resource exports.

In the first 18 months, the financial crisis did not trigger a boom in commercial timber exports in Southeast Asia and Melanesia. Instead, a sharp drop in demand from the main buyers—Japan and South Korea—contributed to falls in aggregate log production in the region. This had the environmental benefit of lowering unsustainable harvesting rates. By temporarily weakening commercial interests, it has provided more scope to reform the timber industries in countries like the Solomon Islands, Papua New Guinea, and Indonesia. It has also increased the leverage and input of donors over environmental management. Reforms in these countries could be derailed, however, especially considering that demand is resurging—driven in part by China. This could put Southeast Asian and Melanesian forests again under intense commercial pressure, perhaps even greater pressure than before the crisis as governments and firms pursue foreign exchange despite relatively low world prices for tropical timber.

Reforms now occurring to Indonesian commercial timber management will not automatically translate into less pressure on the forests. Many companies are planning to expand palm oil, rubber, and pulp and paper production, contributing to new environmental pressures on forests. Some policy reforms will have unclear environmental implications, such as eliminating restrictions on foreign direct investment in the palm oil industry and measures to liberalise the timber trade. Others however, if effectively implemented, will certainly lead to better forest management, such as limiting the size of concessions, cancelling timber licences gained through corrupt or nepotistic ties, and developing genuine community forestry programs.

Donor support for environmental projects, NGOs, and regional cooperation

The implications of the crisis demonstrate the value of donor support for past and current environmental projects in Asia. This is especially important in cases where government, corporate, or community support for environmental conservation or protection has weakened. The causes and effects of the crisis also reinforce the need for donors to continue to stress transparency, accountability, financial responsibility, and more efficient use of resources. This further points to the need for donors to build mechanisms to respond effectively when the conditions that underpin the original aid project change suddenly.

Moves to promote agricultural and natural resource exports, rising levels of poverty and unemployment, and new migrants in rural areas will all strain rural environmental resources. This in turn could add to social instability in rural and remote areas. In this context, supporting better social conditions of communities, especially ones in fragile ecosystems, will indirectly support better environmental management. Reducing poverty and creating jobs in these areas, through initiatives like microfinancing, will also indirectly promote better environmental management. Projects that simultaneously create jobs and improve environmental conditions—such as reforestation or rural water and sewage systems—therefore create double benefits for the environment. These projects must, nevertheless, meet adequate environmental standards. It seems reasonable for donors to consider supporting such projects even when counterpart funding is unavailable. Donors may be able to find additional funds from other sources, from non-financial contributions from counterparts, or by reallocating resources from aid projects that are less important or no longer viable given the Asian financial crisis.

Related to the previous point, recipients now have stronger incentives to support 'brown' environmental projects compared to 'green' ones. Brown projects, such as water and sewage systems, create immediate benefits, including addressing some of the greatest threats to the poor. It is logical for donors to support these environmental infrastructure projects. Yet donors still have an important role in supporting green projects, even when this involves less counterpart

support. These are often cheaper and involve preserving irreplaceable environmental resources—such as old-growth forests, and biodiversity.

The crisis, along with recent regional environmental disasters such as the 1997 forest fires and haze, points to the need for donors to support regional cooperative efforts to address environmental problems. Working with ASEAN to build these linkages is one logical option. Building cooperative ties across development agencies is another.

Support for monitoring, enforcement, and community/market incentives

Asian governments have cut environmental budgets since the financial crisis began. Environmental protection and conservation also appear to be lower priorities. So far, however, it is unclear whether environmental management has absorbed a disproportionate percentage of overall budgetary cuts. Nevertheless, with fewer funds available for environmental protection and conservation, assistance from donors is even more crucial to maintain viable and effective programs.

To cut costs and ride out the financial crisis firms have strong incentives to ignore environmental regulations. Since the crisis began, there is some anecdotal evidence of increased illegal dumping of wastes, as well as illegal logging, fishing, and mining practices. There is, however, a need to systematically document these changes. At the same time, many governments and communities have less technical and financial capacity, as well as less political will, to enforce environmental rules. Governments and communities need support and incentives to enforce environmental rules strictly and consistently.

Environmental management has become increasingly decentralised since mid-1997, partly driven by national governments coping with fewer funds, and partly by political and administrative reforms, some of which began prior to the crisis. Technical and financial support from donors will be crucial to help local governments, communities, and nongovernmental organisations handle these new responsibilities. This support will also be essential as governments restructure bureaucratic departments and revise management policies.

Related to the above points, as the financial crisis weakens the capacity of states to use command-and-control management models, governments and international agencies need to rely more on market and community-based incentives to push firms to follow environmental regulations. These include eco-labels, international standards, emission and user charges, and environmental taxes. With limited funds available for environmental clean-ups, it is also important to push firms to stress pollution prevention, including the transfer of pollution prevention technology.

Further research

So far relatively little research has been done on the environmental implications of the Asian financial crisis, although the World Bank report (1999) is an important recent contribution. This partly reflects the limited amount of reliable data available, although some patterns and trends have emerged. Further research is still necessary, particularly indepth studies that focus on specific sectors and areas. Detailed research is required on changing practices in water use, industrial pollution management, waste disposal, logging, fishing, mining, and agriculture. There is also a need to monitor environmental regulations and budgets systematically, especially how the reallocation of resources within environmental agencies affects conservation and enforcement. Further research is also necessary to understand the mixed environmental implications of changing trade and investment patterns. Particular donors can play a key role funding some of this research, as well as helping to coordinate the research of donors, nongovernmental and governmental organisations, and research institutes.

Introduction

Over the last three decades most of Asia experienced rapid economic growth. Many countries reduced poverty, improved education, and saw substantial increases in life expectancy. Yet these accomplishments involved severe environmental costs, which in part arose from the region's weak environmental institutions and policies. As a result, as the President and a Senior Research Fellow of the Philippine Institute for Development Studies succinctly noted in April 1998: 'Asia is the most polluted and environmentally degraded region in the world' (Intal and Medalla 1998:1; for details see Panayotou 1997; Merson 1998).

Loggers have degraded much of the old-growth tropical forests in the Asia-Pacific, contributing to widespread deforestation. Forest fires have burned huge areas, and in the case of the 1997 ones in Kalimantan and Sumatra, spread a choking haze across Southeast Asia. Deforestation and erosion have contributed to agricultural degradation and devastating floods. Vehicle lead emissions in Asia are now well above World Health Organisation standards. Lead in Manila, for example, may be affecting some children's IQ scores by 4 or more points (World Bank 1999:4; Cubol 1998). Urban air and water pollution are at times overwhelming, especially in the megacities of Manila, Jakarta, and Bangkok. Many of the poor in Southeast Asia and the South Pacific do not have access to clean drinking water or adequate sewage systems. Companies frequently dispose of hazardous wastes improperly. Meanwhile, steady population increases throughout the region have added to these environmental problems. The population in Asian megacities, for example, is expected to more than triple from 1995 to 2025 (126 million to 382 million) (Asian Development Bank:www).

The environments of the Asia-Pacific, then, were already highly vulnerable when the economies throughout the region began crashing in mid-1997. This has been one of the world's greatest economic upheavals. Krugman (1998b), an economist at the Massachusetts Institute of Technology, wrote in September 1998: "Never in the course of economic events—not even in the early years of the Depression—has so large a part of the world economy experienced so devastating a fall from grace."

The crisis—both in the short and long-terms—is exacerbating existing environmental problems in the Asia-Pacific, as well as creating additional ones. It has both direct consequences as well as indirect effects as a result of adjustments and policy reforms. The resulting environmental degradation now occurring is feeding back and aggravating the economic and social problems, creating a cycle that is hard to break.

Yet the picture is complex and variable. The crisis is contributing to shifts in the processes driving environmental change as well as the relative environmental costs for various societal groups. Some geographic areas, economic sectors,

and segments of the population are absorbing higher costs. In other areas and sectors environmental pressures are declining, at least temporarily. Some areas have been particularly hard hit, especially where droughts, fires, and other natural disasters have occurred alongside the crisis. Shifts in the sources and relative importance of various causes of environmental change, as well as the extent and location of environmental problems, are central integrating themes of this report. The analysis pays special attention to how these environmental changes are affecting communities and marginalised segments of society, such as the urban and rural poor.

The study recognises that simple calculations cannot determine the costs and opportunities of the changes triggered by the financial crisis. Instead, costs, benefits, and opportunities occur simultaneously. Some economic costs of the financial crisis are contributing to worse environmental conditions; but some changes are having positive or neutral environmental effects. Moreover, different segments of the population are absorbing economic, environmental, and social costs to varying degrees. An environmental benefit for one group may entail severe economic, social, or even environmental costs for another group. It is essential to recognise, then, that as the lens and levels of analysis move, and as the underlying prioritisation of concerns shifts, the conclusions regarding the net costs will naturally vary. Recognising these complexities means accepting that both effects and interventions will have multiple interrelated repercussions.

Parameters

This report provides an overview of the environmental implications of the financial crisis in Indonesia, the Philippines, Thailand, Indochina and Melanesia. Special attention is given to Indonesia where the crisis has so far had the greatest impact. China, despite its relative importance to the region and the donor community, is given comparatively little attention because the effects of the financial crisis, at least by mid-1999, have been less extensive. Vietnam, Cambodia, and Laos also receive less attention, in part because their relative lack of integration into the international economy has lessened the immediate impacts of the crisis. The analysis of Papua New Guinea (PNG) and the Solomon Islands concentrates on the effects on commercial logging, which was hit especially hard by a sharp drop in demand and prices in Japan and South Korea in 1997 and 1998.

The crisis—both in the short and long-terms—is exacerbating existing environmental problems in the Asia-Pacific, as well as creating additional ones.

The study assesses the quantitative and qualitative environmental impacts of the crisis on forestry, fisheries, mining, agriculture, water and air pollution, and conservation. It seeks to document and account for variations across sectors, as well as across and within countries. Throughout, it assesses both the positive and negative environmental implications of the crisis. More specifically, it seeks to highlight areas where the crisis has created potential windows of opportunity to improve environmental management as well as areas where the crisis is having immediate negative environmental impacts.

To guide this analysis, the study distinguishes between short-term and long-term impacts. Rapid depreciation of regional currencies, sudden changes in demand and prices for natural resources, increases in unemployment and poverty, and sharp falls in government and personal incomes tend to have more immediate impacts. Longer term implications arise more from policy changes—which take time to implement—as well as socio-economic restructuring.

Contribution

In 1997-98 analysts conducted considerable research on the economic, and to a lesser extent the social, effects of the crisis. Yet relatively few indepth studies were done on the environmental effects (Copus Campbell and Ferguson 1998:2). This study adds to recent efforts to fill this research gap, such as the World Bank (1999) report entitled "Environmental Implications of the Economic Crisis and Adjustment in East-Asia". Understanding the environmental implications of the crisis is essential for the long-term recovery of the region. As Bjorn Stigson, president of the World Business Council for Sustainable Development, pointed out in September 1998: "The environmental problems in Asia are under-estimated and ... are a potentially bigger problem for continued economic development than the present economic crisis" (Asia Environmental Trading 1998a:2).

Without preventative measures, a second crisis—one that centres on environmental problems—could well be on the horizon. In November 1998, Ken Newcombe, senior environmental advisor to the World Bank, summed up the potential impact of the crisis on agricultural and forest lands: "(It) is more insidious and damaging long-term because you cannot restore this natural capital. Once lost, it's not available for the next generation and it undermines the capacity of these economies to reach for a truly sustainable development" (quoted in Agencies 1998).

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Because this report builds on only one-and-a-half years of empirical evidence, much of which is still preliminary and sketchy, the conclusions are inevitably suggestive and at times speculative. Definitive conclusions are not possible at this point. Yet this does not decrease the importance of the work. If anything, this increases its value as governments struggle to handle environmental problems during the crisis as well as lay the groundwork for post-crisis management. Waiting for definitive conclusions and firm statistical evidence could well lead to responses that are too late, or excessively costly, not only in environmental terms but also financial and social terms.

The first part of the next section provides a sketch of the financial crisis, not with the intention of contributing any new analysis but merely to provide essential information for understanding the environmental effects of the crisis.

Asia's financial crisis

In 1997 Asian currencies began to crash, triggering economic crises throughout the region. The specific causes of the financial crises vary considerably across and within countries. A large number of studies have already been done on the causes (see Krugman www; Roubini www; Griffith-Jones 1998; Bello 1998; Gates 1998). Debates about what went wrong will likely never be resolved. As Krugman (1998a) correctly notes, 'Anyone who claims to fully understand the economic disaster that has overtaken Asia proves, by that very certainty, that he [she] doesn't know what he [she] is talking about.'

It is sufficient here to note at the most general level that "The crisis arose from both microeconomic and macroeconomic factors, especially microeconomic and regulatory infirmities in the financial arena as well as macroeconomic vulnerabilities particularly to contagion and loss of investor confidence" (Intal and Medalla 1998:2-3). Factors that sparked the crisis included excessive economic expansion backed in large part by private debt; inadequate regulation of, and weaknesses within, financial institutions; collusion, corruption, monopolies, and inappropriate government-business relations; and external economic pressures and domestic political instability (World Bank 1999:2). The initial response to the crisis, both domestic and international, may also have exacerbated the crisis.

The crisis started in Thailand and then spread to South Korea, Indonesia, and finally the rest of Asia. Even countries like Vietnam, Laos, and Cambodia—with nonconvertable currencies, no stock exchanges, and largely rural and agrarian populations—were gradually dragged into the crisis as foreign investment, tourism, and exports linked to Asia fell (Lamb 1998).

So far Indonesia has suffered the greatest economic turmoil. The economy shrank in 1998 by 10-15 percent. The Indonesian rupiah depreciated over the first year of the crisis, at times fluctuating wildly, in 1997 and 1998. In July 1997 it was around Rp2,450 to the US dollar. By September 1998, it was around Rp11,000 to the US dollar. Prices for essential goods have soared in Indonesia.

Indonesia's Minister of Manpower, Fahmi Idris, estimated in mid-1998 that unemployment would likely exceed 15 million by the end of 1998—over 17 percent of the country's workforce. The Indonesian government estimated that 80 million people, or around 40 percent of the population, had sunk below the poverty line by late 1998. (This estimate may be high, however, as a recent World Bank survey only found about 14 percent of the population living in poverty.) Many people in the sprawling slums of Jakarta faced food and nutrition shortages in 1998. Women appear to have been disproportionately affected by the hardships of the crisis (Baillie 1998).

The changes now occurring will impact on the

lives of ordinary Indonesians well past the end of the financial crisis. UNICEF estimated in October 1998 that the crisis had pushed at least half of all Indonesian children under two into malnourishment, while 65 percent of children under three had become anaemic. Coupled with the rapid rise in school drop-outs and falling health standards, according to UNICEF, Indonesia could lose a significant portion of the intellectual capital of an entire generation (Williams 1998:1).

The next section provides a preliminary assessment of the effects of the crisis on agriculture, mining, fishing, air and water pollution, sanitation, conservation, and shrimp farming. It reviews these issues with particular attention to the importance of rising levels of poverty and unemployment, lower incomes, a reduction in industrial output, as well as changing migration patterns.

The impact on the environment

Poverty, incomes, unemployment, and migration: Changing patterns

Poverty, lower incomes, and unemployment are inescapably intertwined with environmental change. Many examples exist of poor people managing resources effectively, particularly when local institutions and social interaction create supportive conditions. Yet greater poverty and people's search for income—especially when this arises unexpectedly—frequently intensifies pressure on surrounding natural resources, such as forests and water. In Indonesia, the Director General of Forest Conservation and Protection noted in August 1998 that increasing numbers of people were pillaging forests to survive. People in Central Java, for example, have started to cut teak trees illegally, overwhelming the capacity of forest guards. Evidence is also emerging that as the cost of kerosene mounts people are turning to wood for fuel (Sunderlin 1998:3).

To some extent, then, the crisis is driving the poor to degrade the environment to survive. Yet it is important to stress that environmental degradation tends to most directly hurt the poor—such as dirty and unsafe water, inadequate sanitation, erosion and flooding, toxic waste sites and disposal, and indoor air pollution from burning fuels. For policy prescriptions, therefore, the poor are most appropriately seen as victims of the mounting environmental degradation, and only secondarily as potential contributors.

Since mid-1997 unemployment has risen in cities and towns throughout Asia. At the same time, real wages have fallen. In Indonesia and Thailand this has apparently stemmed the flow of rural migrants to urban areas. It also has apparently pushed some people back to the countryside, although the exact numbers are uncertain. By January 1999 unemployed workers from Bangkok who had returned to their home villages were starting to occupy state forests to obtain land (Tangprasert and Ratchasima 1999). The net effect on migration is not yet clear, however, since some people are also apparently returning to Bangkok to work in the informal sector (World Bank 1998b).

Interestingly, by early 1998, a net movement back to the countryside was not apparent in the Philippines, perhaps because El Niño drought conditions were driving people to Metro Manila at a time when the crisis had not yet reached the Philippines with the intensity of Thailand, South Korea, and Indonesia (Intal and Medalla 1998:16). At least during the initial stages of the crisis, more workers also headed overseas, especially to North America. Many of these workers are sending money back to their family, providing an important source of income for rural areas.

The Indonesian government has also encouraged migration back to the countryside by, for example, making it relatively cheap for over three million urban workers to return home for the 1997-98 Ramadan holiday. Meanwhile, firms used this opportunity to close some operations (Clay 1998:9). One indication of the apparent trend 'back to the countryside' is an Indonesian Central Bureau of Statistics survey that found agricultural employment in Indonesia increased by 5.6 million between February 1997 and February 1998. Another indication is the estimate by the Indonesian Minister of Manpower that the number of part-time agricultural workers would rise by more than 9 million by the end of 1998 (Sunderlin 1998:6).

This increase in agricultural employment in Indonesia will alleviate some of the social and environmental pressures on cities and towns. But

it will simultaneously intensify pressure on rural agricultural land and water, especially since many of the migrants do not have a deep knowledge of sustainable agricultural practices. To recover higher fuel, transportation, and equipment costs some migrants and farmers are likely to expand production—often out of sheer necessity—with little attention to ensuring adequate land for future crops. Marginal lands and forests will be especially vulnerable as migrants and farmers stake out new areas.

Agricultural expansion

A full review of the effects of the Asian financial crisis on agriculture would require an extensive report. For this reason, this section is limited to a brief overview of why expanding agricultural development is a logical response to the crisis and how this will effect environmental management.

Sunderlin (1998:2) points to five main reasons why expanding and supporting agriculture is an attractive response to the economic and social effects of the financial crisis. First, the agricultural sector is less dependent on foreign currency inputs; therefore, the financial crisis has affected this sector less. Second, adequate food supplies are essential for social and political stability; therefore, governments have strong incentives to support this sector. Third, this sector is critical for absorbing unemployed urban workers who migrate back to the countryside in search of work as well as rural youth who no longer leave in search of urban employment. Agricultural employment, then, has become a crucial 'social safety valve'. Fourth, increasing domestic agricultural output can reduce the costs of expensive, yet essential, agricultural imports such as rice, soy, and wheat. Finally, and in Sunderlin's view most importantly, the depreciation of local currencies allow countries like Indonesia to sell agricultural goods on the international market much cheaper in terms of US dollars—also the case for timber, mineral, and fish exports. Moreover, the costs of agricultural production are primarily in the local currency (except for fertiliser and chemicals), while the profits are often in US dollars.

In late October 1998, the Forestry and Plantation Minister Dr Muslimin Nasution reiterated the government view that agribusiness was an important engine to help pull Indonesia out of the economic downturn (Antara 1998a). Industrial workers moving back to agricultural employment will also indirectly reduce industrial pollution. Without careful planning and management, however, agricultural expansion could greatly increase the pressure on natural forests, both primary (old-growth) and secondary (logged). One of the greatest pressures could come from the development of palm oil estates (examined in detail later in the report). Moves to increase the production of cocoa, coffee, shrimp, rubber, and pepper could also add to these pressures in Indonesia.

From mid-1997 to January 1998, the producer price of cocoa in Indonesia increased six-fold. Indonesian cocoa is grown mainly in South Sulawesi. In 1997 cocoa covered about 160,000 hectares of South Sulawesi. If recent trends hold, by 2000 this will increase to 220,000 hectares, partly driven by higher prices. Indonesian coffee exports have also boomed during the crisis. By mid-1998 Indonesia had surpassed Vietnam as Asia's largest producer. While this has allowed many families to grow coffee, this boom is hampering government efforts to reclaim conservation forests. High coffee prices have encouraged some relocated families to return to conservation forests and again grow coffee. The government also recently announced targets to increase the area under rice cultivation by 500,000 hectares, corn by 117,000 hectares, and soy by 164,000 hectares (Sunderlin 1998:5-6).

The current moves to expand agricultural and plantation exports parallels the earlier expansion of plantations in Indonesia that began after the 1986 devaluation of Indonesia's currency (Clay 1998:7).

Mining, fishing, and conservation

As with agricultural exports, promoting natural resource exports, such as minerals, is a logical response to the currency devaluations. In the case of mining, except for equipment, local currencies account for most costs, while profits are in US dollars. Mining exploitation has apparently increased during the crisis, including by small miners who are exceptionally difficult to supervise. The Indonesian government awarded 50 contracts in February 1998 to mine gold, coal, diamonds, and nickel, bringing the total number of mining contracts in Indonesia to 269 (Sunderlin 1998:7). The government is now encouraging foreign investment in the mining sector to try and maximise its foreign currency earnings.

Environmental management of mining in Indonesia is often questionable. One indication is the large number of mining sites located in protection forests. For example, there are six mining sites in Kutai National Park in East Kalimantan and three in Bukit Soeharto Recreation Park (Sunderlin 1998:7).

As with mining, fisheries management and policies in the Asia-Pacific are often ineffective or distortionary. Low user fees undermine government revenues and encourage over-fishing. Monitoring and enforcement are weak, including in environmentally sensitive areas. This has led to aquatic resources being "substantially over-harvested" in the region (World Bank 1999:15).

Similar to mining, the financial crisis has generated greater incentives to export fish products and earn foreign exchange, again because many of the costs are in local terms. The Indonesian Agriculture Minister Soleh Solahudin sees great potential in fish exports. In October 1998 he declared that "Indonesia has a good chance of becoming the world's biggest fishery commodity exporter" (Antara 1998b).

Soleh Solahudin also sees fish exports as an important source of income during the financial crisis. He recently pointed to one firm with profits in 1998 equal to its previous twelve years of operations. He estimated that revenue from exports of sea fishery commodities in 2003 would reach US$2.64 billion, while exports of coastal fishery commodities would hit US$7.36 billion. Shrimp breeding ponds in coastal areas were, in his view, especially important for the success of the industry. To support these efforts, Soleh Solahudin explained that the government was currently working on a scheme to provide fishers with low-interest credit, similar to the credit that some rice farmers currently receive (Antara 1998b).

To some extent, then, the crisis is driving the poor to degrade the environment to survive. Yet it is important to stress that environmental degradation tends to most directly hurt the poor—such as dirty and unsafe water, inadequate sanitation, erosion and flooding, toxic waste sites and disposal, and indoor air pollution from burning fuels.

The financial crisis has also apparently contributed to some changes in fishing practices, including illegal activities. At this point, however, no one has systematically documented these changes. Some anecdotal evidence exists, however. In Indonesia, the use of dynamite to sweep fish from a specific area appears to be increasing. This has severe implications for coral reefs. The use of cyanide to capture large fish for display tanks in places like Hong Kong and Singapore also appears more common, even though this practice often kills the smaller fish in the area (Wall Street Journal 1998).

There also appears to be an increasing number of smaller, owner-operated fishing boats in Indonesia. More fishers may also be involved in

poaching. Some fishers appear to be selling from their boats at sea (perhaps to Japanese buyers), rather than going through regulated markets on land. Higher diesel fuel prices also appear to be encouraging fishers to stay closer to shore or move to new locations, to some extent altering their type of catch. Fish prices have also changed quickly since the crisis began, which may be contributing to changes in the type of catch. For example, the market price of live grouper—popular in East Asia—fell by 40 percent in the first half of 1998 (World Bank 1999:17).

The devaluation of the Indonesian currency provides greater incentives for fishers to focus on species with a high export value. Urban to rural migration also appears to be putting more pressure on local fish supplies. This trend may be reinforced by the rise in local currency terms of animals and eggs, which may push up local consumption of fish products (although lower real incomes and unemployment will simultaneously push consumption down) (World Bank 1999:17). Further research is necessary to determine the potentially positive and negative implications of all of these changes for biodiversity and fish stocks, including in the oceans north of Australia.

The crisis has also had important implications for shrimp farming in Southeast Asia. In Indonesia, for example, which even before the crisis had some of the world's largest shrimp farms, hundreds of hectares of mangrove forests have apparently been cleared for shrimp ponds in South Kalimantan (Clay 1998:9). In the early stages of the crisis shrimp farms in Indonesia fared especially well, partly because of high world shrimp prices. One shrimp farmer in northern Aceh, for example, "realized 136 million rupiah in income from the two shrimp ponds he harvested between May and September [1998]—almost double what he would have expected in normal times" (Far Eastern Economic Review 12/3/98, quoted in Akella 1999:85). By the end of 1998, however, falling shrimp prices (from 150,000 to 60,000 rupiah a kilogram) and high input costs had made shrimp ponds less profitable (Akella 1999:85).

Shrimp farming in Southeast Asia was often highly profitable even prior to the crisis. In 1995 in the Malaysian state of Sarawak, for example, tiger prawn farms generated an average profit of around RM30,000 per hectare, compared with RM2,100 to RM4,600 for vegetables, rubber, and oil palm (Asia Environmental Trading 1998a:4). The fall in the world price of prawns—in Thailand, for example, the price of black tiger prawns fell from up to 500 baht per kilo to only 100 baht per kilo in late 1998—has at least temporarily reduced the potential for windfall profits.

Concerns over land salination, water quality, and environmental spillovers led several governments in the Asia-Pacific region to restrict shrimp farming in 1998. The Thai government has "instructed governors of 16 provinces to complete action plans banning inland shrimp farming" (Asia Environmental Trading 1998a:4). The Sarawak government has announced that prawn farms must now obtain licences, which could cut tiger prawn production in half. These moves demonstrate the complexity of government reactions to environmental degradation, which involve a complex assessment of business, political, bureaucratic, and local pressures. This example also demonstrates the need to qualify any sweeping generalisations about how governments are reacting to the pressures brought on by the Asian financial crisis. It also demonstrates the importance of stable prices to maintain viable commodity-export industries.

Finally, the financial crisis appears to be undermining conservation and increasing the pressures on endangered animals and national parks. In Indonesia, local wildlife has become an even more important food source. Rare wildlife, some from the remotest areas of the country, are now being sold at local markets as hunters search farther afield. Wildlife, such as endangered macaques, are also being sold to foreign fishers for food. Rob Lee, a biologist with the Wildlife Conservation Society at the Bronx zoo, laments: "What's so sad is the rarest animals fetch little more than the most common wild-pig meat" (quoted in Wall Street Journal 1998).

Air pollution

The air of many Southeast Asian cities is severely polluted. In the mid-1990s the United Nations Environment Program ranked Bangkok as the second most polluted city in the world, after Mexico city. Jakarta was third (Jakarta Post 1996).

Particulates and lead pose two of the greatest threats to human health in Asia. Motorcycles, diesel trucks and buses, industrial plants (especially small and medium ones) and the use of kerosene are the main sources of particulate emissions. Leaded petrol (gasoline) is the main source of lead. Lower incomes and industrial output may be reducing air and lead pollution as fewer vehicles and industries contribute to pollution, although this still needs to be statistically documented.

The World Bank (1998a:105) predicts that by the year 2000 the crisis will lower particulate emissions in Indonesia by 17 percent and lead by 20 percent compared to the projected levels, assuming that Indonesia does not recover to previous levels of industrial output. Any positive environmental impact on air pollution in Indonesia will likely be short-term, however, as new investment, which often brings newer and cleaner technologies, slows. Moreover, industries that remain will have less capital to invest in environmental technologies as they struggle to survive. These firms will seek to cut costs. Sidestepping environmental, health, and safety standards are typical ways firms attempt to reduce costs. Finally, the crisis will also undermine the ability and willingness of governments in the region to enforce stricter standards on vehicles, a crucial step towards reducing urban air pollution. As a result of all of these changes, the World Bank (1998a:105) predicts, "the medium-term impact of the crisis ... will ... increase the average

emissions per unit of GDP by 5 to 10 percent in 2005."

At the same time, fewer government subsidies for fuel—such as the subsidies in Indonesia on diesel to support public transportation and kerosene to help poor households with cooking and lighting—could partially offset these more negative changes by raising prices, lowering consumption, and fostering greater efficiency. However, fully removing fuel subsidies has potentially explosive political and social repercussions, as the riots in Indonesia that followed the fuel price hikes on 5 May 1998 demonstrated. The Indonesian government abandoned these measures within a week. As the World Bank (1999:22) notes: "great attention needs to be paid to the sequencing, timing, and proper 'packaging' of price adjustments with compensating social measures. Instead of one-time large price adjustments, for example, a gradual approach may be more feasible."

A similar scenario of greater air pollution in the long-term appears likely in the Philippines and Thailand, although no conclusive data are yet available. One indication of the potential for a long-term increase in air pollution, however, is the decision by the Thai government to delay introducing the "Euro 2000 standards for diesel buses due to a backlog of unsold vehicles" (Asia Environmental Trading 1998a:2).

Water pollution and sewage

Unlike particulates and lead, the financial crisis has apparently triggered even more water pollution in the short-term. This has an especially great impact on the lives of poor people. The World Bank (1998a:105) estimated in 1997 that dirty water and inadequate sanitation already lowered the life expectancy of people in the Asia-Pacific by almost two years.

Even prior to the crisis, countries within Southeast Asia were suffering from extensive water pollution. The loss of mangroves, along with the run-off of pesticides and topsoil, has polluted coastal areas. Deforestation and erosion have altered seasonal water flows and supplies. Irrigation systems are unreliable and urban water supplies are often filthy, in part because of poor sanitation facilities. In Thailand the Pollution Control Department estimates that the water in 33 percent of the major rivers is below standard; only 18 percent are in good condition (Inchukul 1998). In Vietnam, for example, no city has adequate wastewater treatment. According to the AusAID Vietnam Country Strategy (1998:31), "There are 3,000 industrial enterprises discharging wastewater into rivers and lakes without treatment."

In Indonesia only 40 percent of urban homes had access to adequate sanitation in the mid-1990s. Sudharto P. Hadi at Diponegoro University estimated in late 1996 that seawater had contaminated 97 percent of wells in Jakarta and that 70 percent of Indonesia's rivers were polluted (Jakarta Post 1996). According to Indonesia's Secretary General of the Ministry of Public Works, at the end of 1997 public water pipes in Indonesia supplied just under half of the urban population. He noted further that less than 5 percent of the urban population was served by a central sewage system. The Vice Chair of the Indonesian Environmental Impact and Management Agency noted in November 1998: "effective water quality management still remains our greatest challenge and our highest priority for pollution control" (Asia Environmental Trading 1998b).

In Bangkok alone, the annual cost of air and water pollution was about US$2 billion. Panayotou (1997) estimated that "Despite the rapid and steady growth in income and wealth, still one in three Asians has no access to safe drinking water, and one in two has no access to sanitation services; only in Africa is the situation worse."

The amount of suspended solids in water sources provides a general measure of water pollution. The World Bank (1998a:105) predicts that in the year 2000 the amount of suspended solids in Indonesia's water will fall by 5 percent compared to pre-crisis projections. Yet from 2005

to 2015 total emissions will rise slightly compared to pre-crisis forecasts. These estimates are based on the presumption that the crisis is undermining moves by industrial plants to improve waste discharges, as well as undercutting government efforts to provide access to water and sanitation.

This World Bank prediction may be overly optimistic, however. Shakeb Afsah, senior manager at International Resources Group and senior policy advisor to the US-Asia Environmental Partnership, estimated that the financial crisis has lowered monthly output of industrial plants in Indonesia by 18 percent. Yet since the crisis the amount of organic waste per unit of industrial effluent has jumped by over 15 percent, apparently because more factories are simply dumping untreated waste. As Afsah (1998:1) notes, "This finding contradicts the simple view that slower, lower or negative economic growth will reduce industrial pollution." (It is important to note here that Afsah finds that some firms—especially ones that rely heavily on natural resources and foreign markets—have increased production, even though aggregate production has fallen.)

Using data provided by the Indonesian Environmental Impact and Management Agency (BAPEDAL), Afsah's study (1998:2) is especially revealing since, in his words, it "is the first attempt at quantifying the impact of the financial crisis based on enterprise level data." He draws on production and pollution figures for over 150 factories, comprising a large portion of Indonesia's industrial water polluters. These factories are involved in a variety of industrial activities, including plywood, palm oil, sugar, rubber, pulp and paper, and textiles. The data cover the period from 1995-1997. While the crisis first hit Indonesia in June and July 1997, the effects of the crisis on the behaviour of firms only started to show up in September 1997. Therefore, Afsah compares total production and pollution from September to December 1997 with the previous two years. (Once available, the data for 1998 will provide an important check on Afsah's early statistical findings.)

Afsah's work supports the argument that water pollution may actually rise in the short-term as firms respond to weaker government efforts to monitor and enforce regulations, as firms try to cut costs, and as the costs of pollution controls rise. It also points to the strong possibility that illegal dumping of toxic wastes may also increase. For example, Clapp (October 1998:25) examines Afsah's study and concludes in her analysis of hazardous waste in Indonesia and the Philippines: "It is likely that similar results would hold for most hazardous waste generating industries." This poses a serious health threat. Already, from 1975-88 toxic waste releases had increased in Thailand by 1,200 percent and in the Philippines by 800 percent (Salim 1998).

Afsah has generated some important early evidence regarding the aggregate impact of the crisis on water pollution. It is equally important to stress that aggregate figures do not reveal shifts in the specific location of water pollution. In other words, even when the amount of water pollution rises overall, some communities may benefit from the closure of an environmentally-destructive firm or firms. This occurred, for example, when a textile plant in Lagadar village in Indonesia—with a reputation for dumping waste into the nearby river—closed in mid-1998. Indonesian farmers are also less able to afford chemical fertilisers and pesticides, which may help improve the water quality in some rural areas (Yamin 1998).

The financial crisis has shifted levels of demand, export and import prices, and overall trade patterns. The next section examines the impact of these changes on tropical timber to illustrate some of the implications for the environmental management of agricultural products and natural resources. Again, however, it is important to stress that to some extent the implications vary across different natural resources, depending on the nature of the commercial industry, the changes to prices and demand, and the political and policy contexts.

Environmental impacts of the timber trade

Collapse in demand and prices: Short-term environmental implications

A drop in global and domestic demand and prices for tropical timber in the region contributed to sharp falls in exports and production in 1997 and 1998. Overall demand for tropical logs in South Korea and Japan fell partly in response to the drop in demand from the construction industries. South Korea, for example, which purchased US$59 million worth of logs from Papua New Guinea in 1997, purchased almost no logs in the first half of 1998. As a result, the value of log exports from Papua New Guinea fell by US$134 million in the first half of 1998, to only US$57 million. Over 40 timber operators halted production (Brunton 1998a). In Cambodia government revenue from log taxes fell to under US$5 million in 1998, a drop from US$12.7 million in 1997 (Xinhua 1998).

The drop in demand for tropical timber has provided the Solomon Islands and Papua New Guinea a window of opportunity to reform timber management. Solomon Islands Forestry Minister Hilda Kari went as far as claiming in late October 1998 that the country had benefited from the Asian financial crisis, which ended "looming environmental destruction" (Agence-France Presse 1998). The Solomon Islands exported around 559,000 cubic metres of logs from the natural forests in 1997. This was about 175,000 cubic metres lower than in 1995 and 1996 (Dauvergne 1998-99). By June 1998 log exports from Papua New Guinea had only reached 108,000 cubic metres, far less than the first half of 1997 (Seneviratne 1998).

Yet these respites will not last long; moreover, serious problems remain. In Papua New Guinea the volume of logs exported in the last quarter of 1998 was significantly higher than the previous quarters of 1998, driven partly by generous government tax breaks on log exports (Robie 1998). Brian Brunton of GreenPeace Pacific claims: "There has been a rapid deterioration of the forest situation in Papua New Guinea since mid November 1998. We now have a forest crisis" (Brunton 1998b). In the case of the Solomon Islands, while log exports fell, total log production in 1997 was still well over the theoretically sustainable level of 250,000 cubic metres. Also, a huge amount of logs have simply been left in the forest. By the end of 1997 commercial log stockpiles had reached 300,000 cubic metres. Even more alarming, as much as one million cubic metres of uncollected logs remained in the forests (Central Bank of Solomon Islands 1998:18).

The drop in demand for tropical timber has provided the Solomon Islands and Papua New Guinea a window of opportunity to reform timber management

A similar situation has arisen in the forest sector of Indonesia. Timber production fell until March 1998. Because of the collapse in international demand almost 6 million cubic metres of uncollected logs lay in the forests in early 1998 (Jakarta Post 30 Dec 1998: in World Bank 1998a:106). The global price of plywood had also fallen by about US$200 per cubic metre by April 1998. With weaker demand and lower prices timber companies fired workers in the early part

of 1998. For much of 1998 many companies appeared on the verge of bankruptcy as equipment costs soared.

The timber industry's troubles in Indonesia have further increased as the current government delays licence extensions. Of the 421 timber companies, at least 156 were still waiting in late 1998 for the government to approve the extension of their logging contract. In October 1998, Sudradjat, the chair of the Indonesian Forestry Society, estimated that at least 40 percent of Indonesia's companies involved in timber production were considering shifting to more lucrative businesses (Cable News Network 1998).

Under pressure from the International Monetary Fund to eliminate cartels and sever some of the collusive links among state and business officials, the Indonesian government ended Apkindo's (the Indonesian Wood Panel Association) formal monopoly of the plywood industry, effective 30 March 1998. The government also announced plans for numerous reforms to forest policies, including limiting the size of concessions to 39,000 hectares, transferring licences obtained through corruption or nepotism to cooperatives, forbidding new forest concessions, auctioning revoked concession licences, and putting greater emphasis on community forestry. In addition, the government announced plans to review the use of the Reforestation Fund, partly because, according to the Director General of Reforestation and Land Rehabilitation, only 10 percent of this fund has actually supported reforestation (Sunderlin 1998:11).

The changes now occurring to Indonesia's timber industry, however, will not automatically translate into less pressure on the forests. Many timber companies appear ready to move into palm oil, rubber, and pulp and paper plantations, the expansion of which, as is documented later in this report, could contribute to extensive environmental damage. Some reforms will have unclear or ambiguous environmental effects, such as removing restrictions on foreign direct investment in the palm oil industry and efforts to liberalise the timber trade. Moreover, government commitment to implement reforms is inconsistent.

Although the drop in regional demand for tropical wood has relieved some of the immediate commercial pressure on old-growth forests, it has simultaneously led to a rapid decrease in government revenues. For some governments the result has been a sharp decrease in foreign exchange and total revenue, including funds available for environmental management. For governments like the Solomon Islands—which relied on log exports for about half of total export earnings—the collapse in log prices and demand has had especially traumatic economic effects.

Papua New Guinea has also seen a sharp drop in timber revenues. The PNG Forest Industry Association estimated in mid-1998 that PNG was losing around US$4.7 million per week in foreign exchange earnings as a result of the fall in export volumes and prices (Seneviratne 1998).

Moreover, in places like Papua New Guinea and the Solomon Islands timber firms sometimes establish community infrastructure as part of their timber agreement. The financial collapse of a timber company could potentially mean the collapse of local services. In Papua New Guinea, for example, the PNG Forest Industry Association claims that the suspension of logging operations has led to the deterioration of industry-supported communication and transportation systems as well as health services. As Greenpeace activist Brian Brunton noted, these claims are partly "logging company propaganda," although this could become a problem if the crisis lasts a long time (Seneviratne 1998).

Long-term environmental effects

The long-term impact of a prolonged economic downturn on effective environmental management of forests is even less optimistic. Several trends could increase economic and social pressures.

Indonesia's timber industry was rebounding by mid-1998. Chinese demand for Indonesian plywood started to surge in April 1998 after a new Chinese government policy to reduce logging by 60 percent. By mid-1998 Malaysia's decision to restrict timber exports also helped stimulate demand for Indonesian plywood from other Asian countries. Meanwhile, demand from the US, Europe, and the Middle East remained reasonably strong. Some firms have hired mill workers back. By late 1998 total plywood exports only appeared to have fallen slightly, and the forest industry as a whole appeared close to its export target of US$8.3 billion, partly on the strength of the pulp and paper industry (Sunderlin 1998:3; Akella 1999:79).

The emerging picture in the forest sector does not bode well for the environment. As Sunderlin (1998:3) argues, "The combined effect of the low price for Indonesian plywood and potentially high demand, and restricted supply resulting from the fires means that producers will search for stems in ever more remote and inappropriate places. The potential for increased damage in production forests and unauthorised logging in recently-logged production forests and some protection forests appears to be high."

Moreover, urban unemployment and poverty could push the urban poor to migrate back to rural villages. To survive, these migrants have strong incentives to clear land and forests. As documented earlier, governments and firms are turning to natural resource exports—such as fish, timber, palm oil, natural gas, oil, export-oriented crops, and minerals. These exports can help earn critical foreign exchange. Indonesia, for example, exported 7.85 million cubic metres of plywood in 1997, worth US$3.58 billion. This made plywood the second largest non-oil and gas foreign exchange earner, after textiles (Cable News Network 1998). With the rapid depreciation in the Indonesian currency, this foreign exchange is even more vital as the government and businesses struggle to ride out the crisis.

This analysis of the long-term environmental effects of emerging trade patterns in Asia is consistent with previous studies of the links between currency devaluations and deforestation. For example, one study of Indonesia from 1981-85 estimated that on average each one percent fall in the exchange rate was tied to a 1.4 percent jump in the deforestation rate (Capistrano and Kiker 1995, summarised in World Bank 1999:12).

This conclusion, however, is more pessimistic than a World Bank one (1999:13-14), which concluded: "In the long-term, the effects of the currency depreciation will be neutralized as domestic inflation increases. Deforestation levels are, therefore, likely to return to pre-depreciation levels. If the proposed policy measures, such as the reduced export tax on timber, lower import tariffs on agriculture, and the introduction of a resource rent tax are implemented, they will change relative prices in the economy, and the overall effects are likely to benefit the environment" (Table 2 of World Bank 1999:14 provides a list of some of these policy changes).

Many of the reforms now occurring to timber management policies are necessary for sustainable forest management. It is, however, even more important to monitor companies and enforce environmental and tax policies. It is also crucial to control illegal logging. The financial crisis and its after-effects will make these tasks far more difficult.

The next section outlines the ways in which the crisis has altered environmental policies and expenditures and in turn how these changes, along with new contexts created by the crisis, are influencing government capacity and willingness to monitor and enforce environmental regulations.

Government actions and budgets

Environmental budget cuts

The World Bank (1998a:127) noted in late 1998 that the crisis had driven the environment off government agendas. This is hardly surprising considering the pressing social, financial, and political threats now facing many governments in the region.

Quite naturally, government priorities have shifted to job creation, financial restructuring, and social and political stability. Governments have strong incentives to cut expenditures on environmental programs as well as restructure environmental agencies to reduce costs.

Yet the early evidence for the above presumption is still inconclusive. The World Bank (1998a:107) notes: "To date, there is no evidence that environmental spending has been subject to disproportionate cuts." The Bank claims, for example, that in the Philippines the changes to the budget of the Department of Environment and Natural Resources (DENR) have been primarily shaped by mandatory measures that apply to all departmental budgets (World Bank 1998a:107). A more detailed World Bank (1999:18) report notes:

"While protected areas and wildlife management, ecosystem research, and land management received increased funding in 1998, programs under environment and forest management were reduced in 1998 compared to 1996 and 1997. The overall budget of the DENR showed a slight increase in 1998 over 1997 with a significant increase in locally funded projects such as water resources development and management projects, but the mandatory reserve requirements will reduce the actual disposable amount."

This same report (World Bank 1999:18) notes that according to the public expenditure review, "the aggregated budget of the central and regional offices of the Indonesian environmental protection agency, BAPEDAL, increased eight-fold between 1993/94 and 1997/98, including a 36 percent increase in 1997/98 over the previous fiscal year."

Yet, as this report points out, it is equally essential to examine the reallocation of budgetary resources within BAPEDAL. The April 1 1998 budget, for example, "shifted funds from certain programs (for example, water and air quality control) toward decentralization of environmental management by provincial agencies" (World Bank 1999:19). This budget reallocation is in response to a US$43 million loan from the Asian Development Bank (ADB) to support decentralisation. This loan required a counterpart contribution in cash. As a result, BAPEDAL programs for hazardous waste management, and cleaner air and water lost nearly 50 percent of their funding (World Bank 1999:19). According to the World Bank (1999:19), "BAPPENAS, the national planning agency, justifies the shifts in spending priorities by the need to support the decentralization of pollution control programs to the recently instituted provincial BAPEDALDA." Decentralisation in Indonesia, which began well before the crisis, creates potentially positive opportunities to better integrate local governments and peoples into environmental management. However, without sufficient technical, financial, and human support decentralisation could compound the environmental problems associated with the Asian financial crisis.

Overall, the World Bank (1999:18) report concludes: "Limited available data indicate that, at least in the short-term, the budgets of environmental agencies have not been severely cut. However, this situation may change, especially if economic recovery is delayed."

Whether or not environmental concerns are

absorbing disproportionate cuts is difficult to ascertain conclusively given the volume and speed of budgetary changes. Moreover, sufficient and accurate disaggregated budgetary data are not yet available. Nevertheless, funding cuts have forced departments such as DENR to postpone some programs and projects, as well as significantly cut its operational budget. Governments are also under great pressure to find additional funds. In April 1998, for example, to try and generate foreign exchange the Philippine government announced that for at least six months it would remove a ban on lumber exports imposed in 1989. Then Environment Secretary Victor Ramos noted: "It's very important that every sector of society should help in times of financial and economic crisis" (Son 1998).

Budget cuts are likely to have a great impact on Philippine reforestation and conservation efforts. Budgetary changes will also undeniably affect the quality of environmental protection. In the case of DENR, Intal and Medalla (1998:20) argue that "the large drops in operational budgets can be expected to impact negatively on the quality of services provided by the Department."

There is also evidence that regional and municipal governments are cutting environmental expenditures. The Jakarta city government, for example, has already cancelled three environmental programs related to air and water pollution and regreening (Emilia 1998).

Developing countries tend to cut spending on large settlement programs during sharp economic downturns (Sunderlin 1998:6). Indonesia's total spending on transmigration is, however, unlikely to fall in 1998-99 as funds from the International Monetary Fund (IMF), along with other sources of foreign aid, absorb the seven percent shortfall in the Department of Transmigration's budget (Sunderlin 1998:6).

Restructuring of government agencies and services

The crisis has contributed to a review and restructuring of government and corporate institutions, especially in the most severely affected countries of Indonesia and Thailand. The Indonesian government's national logistics agency, Bulog, has come under intense review. As noted earlier, the dominant corporate grouping in the Indonesian timber industry, Apkindo, lost most of its formal powers as a result of IMF-induced reforms in early 1998. The crisis has also triggered the development of new institutions, such as the Bankruptcy Court and the Bank Reconstruction Agency in Indonesia and the National Social Policy Committee in Thailand.

Several countries in the Asia-Pacific, including Indonesia and the Philippines, are devolving greater responsibilities to regional and local levels. This trend may partly reflect central governments with fewer funds trying to cope with providing a full range of services. However, as the World Bank (1998a:107-108) notes, although decentralisation is an important step toward integrating communities into environmental management, it "will achieve little unless additional resources are provided, at least during the transitional period, to build up and sustain local administrative capacity." Given limited financial resources this could even have a net negative impact on environmental management.

Implementation

Collusion among corporate and state officials has contributed to policies that sometimes aggravate rather than alleviate environmental problems. Corporations may also pressure or bribe state officials to obtain favourable agreements or policy settings. Partially as a result, governments have tended to provide generous subsidies, credit, and tax breaks to entice and retain corporate investors (both foreign and domestic).

Nevertheless, environmental legislation in many Asia-Pacific countries is reasonable, although some countries like the Solomon Islands have had significant structural problems with the content and coordination of environmental regulations. In Thailand, for example, Asia Environmental Trading (www) notes that "environmental legislation is comprehensive on paper, covering all major pollution sources and formulated with the assistance of international experts. Environmental legislation was overhauled in 1992 and six new measures introduced relating to: wildlife; public health; energy conservation; hazardous substances; environmental quality, and factories."

Many corporations, as well as small resource producers and farmers, are facing financial collapse. To survive they need to cut costs. This appears to be contributing to an increase in illegal or questionable environmental practices, such as using illegal agricultural chemicals, cutting expenses on mining or timber harvesting practices, illegal fishing, and short-term exploitation of land.

Indonesia has also worked in recent years to reform environmental legislation. In 1997 the government passed Law Number 23/1997 on environmental management. This includes revised regulations on air and water pollution, solid waste disposal, and environmental impact assessments. After President Suharto's resignation in May 1998 Indonesia entered a period of 'reformasi', with significant portions of civil society demanding political and administrative reviews and reforms of laws and rules. At the same time the government was also obligated to implement reforms as part of the conditions for bail-out funds from the International Monetary Fund (IMF). As part of the IMF terms, the government agreed to develop implementation rules for the new environmental laws. IMF conditions further stipulate that budget cuts should "not be taken out of social and environmental programs" (Akella 1999:87). As Akella (1999:87-88) notes, however, "the IMF has no means of actually monitoring how governments are meeting budgetary conditionalities. For example, the IMF does not have a system of accounting for environmental expenditure at all, and therefore cannot possibly determine whether this spending is being threatened or not."

Improving environmental legislation is certainly both important and necessary. Yet the main obstacle to better state management of environmental resources is not poor policies, but weak implementation. As Asia Environmental Trading (www) notes for Thailand, despite the improvements to environmental legislation listed above, "enforcement has been poor and has been hampered by the spread of environmental authority between many government departments, both central and local."

Enforcement of environmental rules is even weaker in Indonesia. The Indonesian Environment Minister in September 1997 summed this up well: "We don't lack laws and regulations, perhaps we have too many of them. It takes a huge crisis for us to really see that we have a basic problem of governance" (quoted in Park 1997). In the first 15 years after Indonesia passed its basic environment law in 1982, only 12 cases of environmental non-compliance have gone to court. According to Indonesia's Secretary to the Minister for Environment in November 1998, the financial crisis has further weakened monitoring and enforcement as the government focuses on trying to meet people's basic needs (Asia Environmental Review, 1998b).

Weak implementation of environmental regulations is likely to worsen the longer the crisis lingers. Higher prices and lower real wages will likely increase the extent of low-level corruption, where bureaucrats and enforcement officers ignore

rules in exchange for 'gifts' or small amounts of cash. The crisis is also undermining state technical capacity to monitor firms. Effectively monitoring timber firms in remote concessions, for example, requires sufficient staff, adequate transportation, and sophisticated equipment.

Many corporations, as well as small resource producers and farmers, are facing financial collapse. To survive they need to cut costs. This appears to be contributing to an increase in illegal or questionable environmental practices, such as using illegal agricultural chemicals, cutting expenses on mining or timber harvesting practices, illegal fishing, and short-term exploitation of land. Further research, however, is necessary to document these changes.

Cash-strapped governments are also likely to be more vulnerable to corporate pressure for lax regulations or enforcement. To keep or lure investors back, governments may offer generous tax breaks and subsidies. In the past, this pattern has contributed to windfall profits for many corporations, contributing to high levels of destructive natural resource extraction.

Investors, especially ones operating in resource extractive industries, often operate under uncertain conditions. The Asian financial crisis has increased the overall level of uncertainty, which will encourage both governments and corporations to focus on even shorter time horizons.

The crisis is also affecting multinational and domestic corporate technological and environmental practices. The next section briefly evaluates some of these changes.

Private sector actions

Environmental research and pollution prevention

Little empirical research has been done on corporate environmental responses to the crisis. This partly reflects the difficulty of gaining access to accurate corporate information and partly reflects that these trends will take time to develop. It is reasonable, however, to hypothesise that the amount of corporate funds spent on environmental research and pollution prevention will fall as firms seek to cut costs. Domestic firms with few international linkages will be especially prone to cut environmental research and measures. Multinationals, however, may also avoid transferring advanced environmental technologies to lower the costs of operations in Asia. Further research and time is needed to test these hypotheses.

Resource efficiency

Coal and oil are the two main sources of energy in the Asia-Pacific, contributing to severe problems with nitrogen oxide and sulfur dioxide emissions. In the worst areas of China, for example, the annual direct costs of acid rain in the late 1980s was about US$2 billion. RAINS-Asia estimated that in 1990 China contribute to 37 percent of Japan's sulfur deposition and 34 percent of North Korea's. Relying heavily on oil and gas also contributes to global warming. In 1992, China was the second largest emitter of carbon dioxide (after the United States). By 2015 the Asian region could well surpass the combined carbon dioxide emissions of the OECD countries (Zarsky 1997).

Many countries in East Asia are not energy-efficient by international standards. Compared to developed countries, the energy intensities of large firms in East Asia are often 20 percent higher while smaller ones are as much as 100 percent higher (World Bank 1999:20). The Asian financial crisis may encourage some companies to strive to use resources more efficiently. This occurred, for example, after the sharp rise in oil prices in the 1970s, which contributed to corporate and consumer moves to improve efficiency (Madsen 1995:207-234). (The currently low global price of oil, however, may well offset corporate incentives in the Asia-Pacific to use oil more sparingly.)

There is some evidence of more efficient resource use in Asia since the crisis began. In Malaysia, for example, the crisis, along with severe water shortages, has contributed to a national focus on more efficient use of energy and water. The government is providing financial incentives for companies "to adopt clean production methods and water recycling technology" (Asia Environmental Trading 1998a:2). The federal government is also providing the state of Malacca with US$600,000 for a new mobile wastewater treatment system.

As of early 1999, the crisis appears to have had less positive impacts on efficiency in the poorer countries of Indonesia, the Philippines, and Thailand. As Asia Environmental Trading (1998a:2) notes: "In general the risk of pronounced environmental degradation in Asia's current economic crisis lies mainly in the very poor Asian nations (Indonesia, the Philippines and perhaps Thailand) where the links between efficiency and environmental performance are not appreciated and there is a need to raise foreign capital quickly."

As noted earlier, Asia's financial crisis has rapidly depleted state financial resources. It has also contributed to significant shifts in the allocation of funds among state agencies. The next section examines how these shifts are affecting large-scale development, with particular attention to the environmental implications of these changes.

Changing patterns of development

Roads

Roads are essential for travel and economic development. Carefully planned roads can also provide travel routes that can decrease human pressure on routes in highly sensitive ecological areas. Yet in remote areas roads can contribute directly to significant environmental problems, including erosion and deforestation. They can create indirect pressures on remote natural resources by providing easier access.

The financial crisis has delayed new road projects. There are also fewer funds to maintain and repair roads. Indonesia, for example, plans to build a road along the Indonesian-Malaysian border on Borneo as well as a Trans-Kalimantan highway between Balikpapan and Pontianak. Yet it is unclear whether these will proceed. The financial crisis has forced the Indonesian government to slash its public works budget. The original 1998/99 budget of Rp6 trillion has been cut to Rp3.4 trillion. The government, with IMF encouragement, is still considering further cuts to deal with the anticipated budget deficit. Already, unable to afford repairs, the government had to close the Trans-Kalimantan highway from Palangkaraya to Banjarmasin in August 1998 (Sunderlin 1998:8).

In the short-term the financial crisis is reducing or delaying the number of new mega-projects typical of Southeast Asia during earlier periods of rapid economic growth. The Bakun hydroelectric dam project in Sarawak, for example, has been shelved, at least for now. The Bakun dam would have been the most expensive infrastructure project in Malaysian history, flooding an area the size of Singapore. Before flooding this area, the plan was to clear 80,000 hectares of forest, generating 3-6 million tons of logs (Dauvergne 1997:111).

Plantations

Unlike roads and dams, the crisis has encouraged plans to develop even more large-scale plantations. Forest plantations in Indonesia, for example, covered around 3.8 million hectares in 1994. This may have reached almost 8 million hectares by the end of 1998 (Yoga 1998). The government aims to make Indonesia one of the world's top pulp and paper producers. The government has a similar aim to overtake Malaysia as the largest producer of palm oil (used to make margarine, cooking oil, and soap), partly using World Bank loans worth US$400 million. This is an ambitious goal considering that Malaysia has also been aggressively expanding palm oil exports, which has been a highly profitable activity during the crisis. For example, Malaysia's largest palm oil company—Golden Hope Plantations—recorded a 30 percent increase in net profits during the second half of 1997. In 1998, the value of Malaysian palm oil exports was predicted to reach M$15 billion, more than $5 billion more than the previous year (McNulty 1998).

However, Indonesia is increasingly becoming a formidable challenger to Malaysian palm oil exporters. Indonesia exported more than US$1 billion worth of palm oil and palm oil products in 1996. Over the last ten years, Indonesian palm oil plantations have grown from 600,000 hectares to around 2.2 million hectares by early 1998. Another 1.5 million hectares was slated for development by the end of 1998. In September 1998 the transmigration minister even suggested shifting the massive transmigration in central Kalimantan towards oil palm instead of food production (Down to Earth 1998).

There are around 50 foreign investors already

involved in Indonesia's palm oil industry. In 1998 Malaysian companies accounted for roughly 80 percent of the investment. Around 75 percent of the 650 investors who now have an application to convert forest land into palm oil plantations are foreign companies (World Rainforest Movement 1999). By 2005, the Indonesian government hopes to increase the area for palm oil production to 5.5 million hectares (CIFOR News 1998: 9). By 2003, Indonesia could well replace Malaysia as the world's largest palm oil producer (Yoga 1998).

The push to build a massive palm oil industry began before the financial crisis. The crisis, however, has triggered even greater interest in palm oil. The global price of palm oil has stayed high while production costs remain low, allowing firms to make windfall foreign exchange profits. Firms can also make substantial profits by clearing the land of valuable timber before planting. Some oil palm and rubber companies apparently never intend to plant, and just clear areas for the commercial timber. Indicative of its profitability during the crisis, in February 1998 the plantation sector shares on the Indonesian stock market jumped almost 30 percent (Sunderlin 1998:4-5).

The development of palm oil, rubber, and industrial wood plantations can severely damage the surrounding environment. In Sabah, Malaysia, for example, the Kampung Sukau village security and development committee chair explained: "The people in the plantations use tonnes of chemicals for the oil palm trees and they eventually flow into ditches and end up in the river. Our river is becoming severely polluted" (Star [The] 1998). So far, however, the greatest environmental impact of plantation companies has been their direct and indirect role in the 1997-98 Indonesian forest fires.

Plantation companies and forest fires

In 1997 and again in 1998 massive fires swept Indonesia's outer islands. The 1997 fires smothered Indonesia's neighbours in a smoky, noxious haze. Hundreds of thousands of people in Indonesia, Malaysia, and Singapore were treated for pollution-related health problems. Klaus Topfer, executive director of the United Nations Environment Programme, remarked in April 1998 that Indonesia's "forest fires may turn out to be one of the greatest ecological disasters of the millennium."

Between 500,000 and 1,000,000 hectares of forests and peat moss likely burned in the second half of 1997, although the Indonesian Nongovernmental Forum for the Environment (WALHI) claims that the area was as high as 1.7 million hectares. Monsoon rains extinguished most of the fires in Sumatra and Western Borneo in early December 1997. The fires returned in January 1998, however, especially around the East Kalimantan towns of Samarinda and Balikpapan, which received less rain. About 450,000 hectares had burned in East Kalimantan by late April/May 1998, when rains returned to douse the fires. These fires altered over 35 percent of the 198,000-hectare Kutai national park. They were some of the worst on record for East Kalimantan, surpassing even the 1982-83 fires that destroyed 418,000 hectares in East Kalimantan (the 1997 fires only affected about 37,000 hectares in this area).

The 1997 fires affected huge areas of peat moss, which is located underground and can burn for years. These fires released huge amounts of carbon dioxide, adding to global warming. National parks and old-growth forests also burned. In October 1997 alone the World Wide Fund for Nature (WWF) reported that at least 17 national parks were on fire, including ones in Sumatra, Sulawesi, Kalimantan, and Irian Jaya. Indonesia's former Environment Minister, Sarwono Kusumaatmadja, claimed that it could take as long as five hundred years for these areas to recover.

The economic cost of the fires was enormous. The Economy and Environment Program for Southeast Asia and the WWF Indonesia Programme estimated that the haze-related costs of the 1997 fires—including short-term health problems, falls in tourism, transportation disruptions, and industrial production losses—exceeded US$1.3 billion. The fires cost Malaysia alone more than US$300 million, enough to fund all of the federal government's social programs over the previous three years. Of course including environmental and timber losses would raise these figures significantly.

A complex mix of factors contributed to these fires. Dry El Niño conditions increased their intensity and scope. Inappropriate policies, weak government enforcement of environmental regulations, an ineffective fire-fighting system, a drop in government revenue driven by the currency crash, and systemic corruption all played a role. So did years of destructive and unsustainable logging. Large areas of formerly old-growth forests are now open, dry, and littered with debris, leaving them highly vulnerable to devastating fires.

Destitute farmers as well as transmigrants with little experience cultivating the fragile outer islands lit some of these fires. The government project to clear, drain, and plant crops on one million hectares of peat swamp in central Kalimantan was an important source of the haze. The peat in this area—dried by the sun—was highly flammable, producing some of the dirtiest smoke in 1997. This project has been scaled back considerably, in part because of the disastrous environmental effects so far.

Yet plantation companies apparently lit most of the fires. The WWF estimates that plantation companies deliberately lit about 80 percent of the 1997 fires, while farmers lit about 20 percent.

Former Environment Minister Sarwono estimated that plantation companies and government-sponsored transmigrants were responsible for more than 90 percent of the 1997 forest fires.

Satellite images support these claims. Approximately 90 percent of the 1997 fires were in areas with plantations or transmigration projects, although locals angry about the land grabs by plantation companies and transmigrants may have lit some of these fires. Former Environment Minister Juwono Sudarsono noted that corporations controlled around 65 percent of the land that burned in East Kalimantan during the first three months of 1998, although again this does not prove that companies lit all of these fires since locals sometimes retaliate against companies and transmigrants who occupy contested land.

Nevertheless, palm oil companies, and to a lesser extent, rubber and industrial timber companies, were mainly responsible. Clearing land with machines and chemicals can cost up to US$200 per hectare. Even though the practice is technically illegal, plantation companies, local farmers, and transmigrants use fires to clear land cheaply, quickly, and easily. Some companies burn areas to establish and justify later land claims. Some companies also burn 'permanent' commercial forests or 'protection' forests to convince governments to reclassify these as areas suitable for conversion to non-forest uses. Burning works best during dry conditions. Yet these very conditions make it more likely that fires will spread out of control (see Dauvergne 1998a).

Donors and the crisis

The reactions of the World Bank and the Asian Development Bank to the crisis are shaping the overall environmental implications. While assessing the full range of reactions and implications is beyond the scope of this report, a brief sketch of a few responses is useful. It is also interesting to note that the revenue shortfall caused by the Asian financial crisis has increased the potential influence of these Banks as well as bilateral donors over environmental management in the Asia-Pacific.

A World Bank study (1999:6) of the environmental implications of the Asian crisis notes: "The first generation of adjustment programs did not specifically address social and environmental issues. The underlying assumption of such programs was that correct economic policies would 'automatically' improve social and environmental conditions." Activist organisations like the WWF became highly critical of the social and environmental implications of World Bank adjustment policies (Reed 1992; 1996). Compared to past economic crises, however, the World Bank appears to be paying far more attention to the environmental and social impacts of the Asian financial crisis. This is part of a broader globalisation of environmental ideas and concerns (Dauvergne 1998b). But it also partly reflects the greater attention within the World Bank to environmental concerns in the 1990s (Haas and Haas 1995; Nelson 1996).

The World Bank's East Asia Environment Sector Unit, in cooperation with the Environment and Rural Development Departments and the Development Research Group, conducted a study in 1998 to assess the environmental implications of the Asian financial crisis (see World Bank 1999). Chapter six of the World Bank (1998a) report, "Environment in Crisis: A Step Back or a New Way Forward?" also provides an overview of some of the environmental effects of the crisis.

The World Bank has also set some environmental conditions with its recent loans. For example, a recent US$1 billion loan to support policy reform in Indonesia included provisions to help protect the environment, especially efforts to deal with the impact on natural resources of huge numbers of people sinking into poverty.

More generally, the World Bank has pressured governments in the region to retain policies designed to increase revenue and reduce dependence on raw natural resource exports. In September 1998 the World Bank refused a request by PNG Prime Minister Bill Skate to increase financial assistance. The Bank insisted that PNG must first improve economic management. The Bank was particularly concerned with proposals to lower the log export tax and give concessions to help companies ride out the Asian financial crisis (Seneviratne 1998).

The Asian Development Bank is also providing various environmental assistance for countries affected by the Asian financial crisis. The Bank, for example, as part of the reform process, is

assisting the Thai government to review market-based instruments for environmental management. In the Philippines, the Bank is focusing program loans on improving air quality and polluted rivers in Manila. In Indonesia, a Bank program loan to address the social effects of the crisis may form part of a set of reforms to decentralise environmental management to provinces and districts (pers Comm, ADB Environment Division, Manila, 28 Oct 1998). The ADB has also commissioned several studies of the environmental implications of the crisis, although as of early 1999 these were not yet available for distribution (pers comm, ADB, Manila, 16 December 1998).

Processes behind environmental impacts

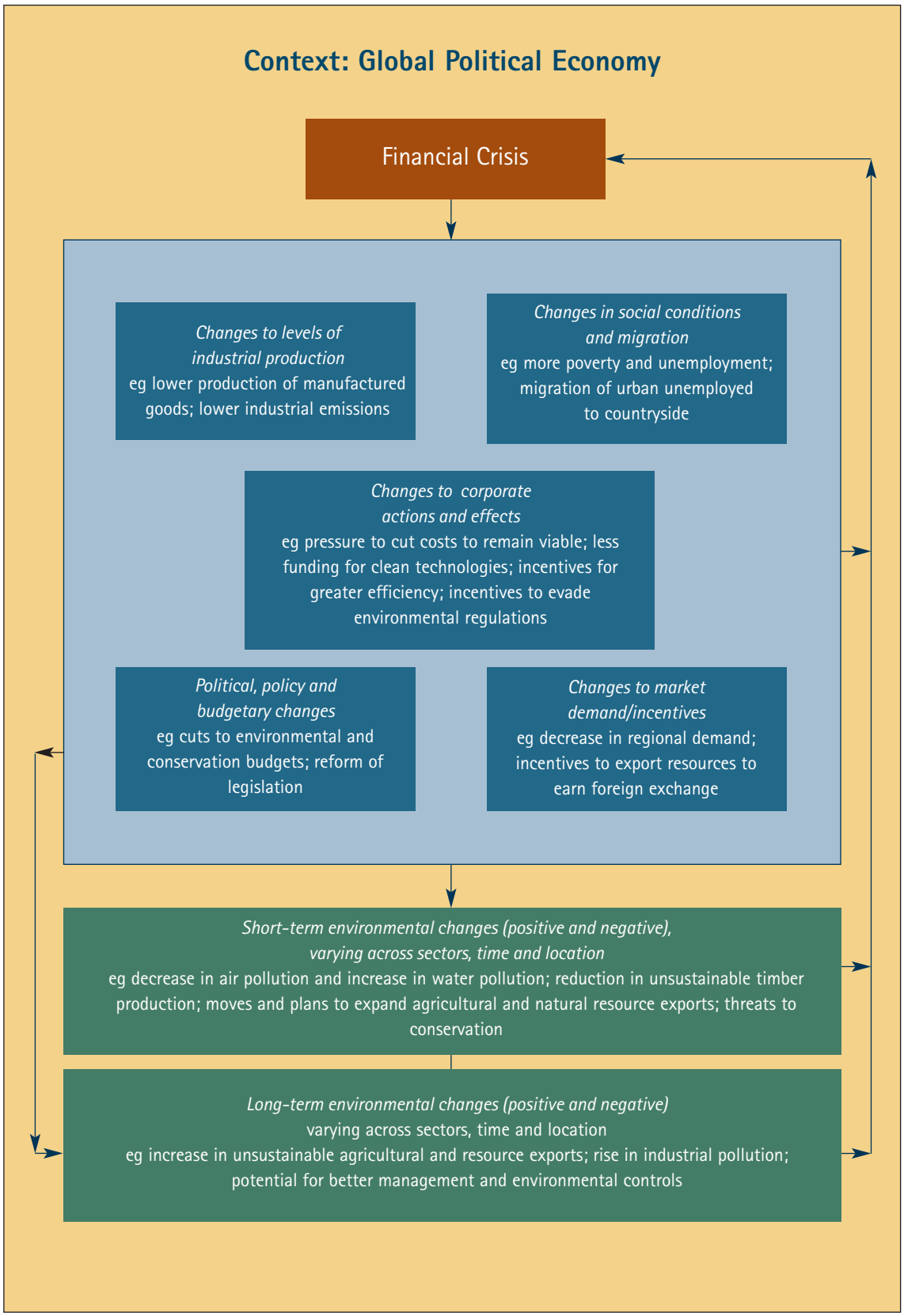
Overall, then, the processes and mechanisms that shape environmental management overlap and have multiple implications, positive, negative, and neutral. Disaggregating one factor—such as a impact of markets on commercial timber production—from the broader picture can lead to erroneous conclusions. For example, while the crisis has lowered unsustainable commercial timber production levels, lower prices have left less money available to support environmental measures.

It is therefore important to consider the economic, social, and political implications when considering the environmental implications of the crisis. For this reason, Diagram 1 does not make a direct causal link between the financial crisis (as an independent or explanatory variable), a specific factor (e.g. migration patterns), and environmental change. While this would be convenient it is overly simplistic to try and create a cause-and-effect chart of the environmental implications of the crisis.

Instead it is better to see the financial crisis as triggering multiple changes to production, social conditions, corporations, political and policy settings, and markets and economic incentives (outlined in the central box within Diagram 1). This new mix of factors has short and long-term environmental implications (short-term environmental changes also have long-term implications). All of these changes in turn feed back into the financial crisis, potentially aggravating or prolonging the crisis.

There are important policy implications for donors of accepting that the processes and mechanisms behind environmental change are unavoidably intertwined and that the effects of the crisis vary across sectors, time, and locations. It suggests that inventions should occur on multiple fronts and that any intervention designed to improve environmental management should consider the broader political, social, and economic implications and how these in turn shape the environmental goals in a particular sector and area.

Processes linking the crisis and environmental change



Conclusions and recommendations

Overall, this report shows that simple generalisations about the environmental implications of the Asian financial crisis are inadvisable—indeed, ignoring the important differences across sectors, time, and particular areas can easily lead to superficial or inaccurate statements. Some geographic areas, sectors, and segments of the population, such as people living near factories dumping more untreated waste are absorbing higher environmental costs. The poor, women, and marginalised groups in society are especially vulnerable, particularly from problems such as water pollution. Environmental conditions for some people, such as those in areas near dirty factories that have closed, however, have improved.

It is important to recognise that environmental changes are part of broader socio-economic changes now sweeping the Asia-Pacific. While one segment of the population may benefit from current environmental changes, another may suffer in terms of, for example, jobs or income. Recognising the multiple effects of these changes, as well as the various implications of interventions, is therefore critical.

The environmental implications of the crisis, then, are diverse and multifaceted. Careful qualifications must therefore accompany broad conclusions and generalisations. While highlighting these conclusions and generalisations, the final section turns to the question: What is the best way for aid agencies to intervene and address the environmental implications of the Asian financial crisis? It is divided into six parts: stability and cycles of decline; industrial output and the environment; currency devaluations, commodity exports and the environment; donor support for environmental projects, nongovernmental organisations, and regional cooperation; support for monitoring, enforcement, and market/community incentives; and further research.

Stability and cycles of decline

Areas in Eastern Europe and the former Soviet Union that had the greatest economic turmoil have subsequently had the greatest problems addressing environmental problems. According to the World Bank (1998a:109) "Countries, such as Poland, the Czech Republic, and Hungary, that experienced the least economic disruption and were quickest to re-establish economic stability" have made "the most rapid progress on the environmental front." This suggests that re-establishing economic stability is critical to the process of improving environmental conditions. This report adds further weight to this overall view. Otherwise, environmental reforms will have great difficulty receiving the necessary government and business support.

As numerous Asian elites argue, most notably Malaysian Prime Minister Mahathir, many developed countries only began to address environmental problems after incomes rose high enough that societies felt they could afford this luxury. Japan is frequently mentioned as a classic example. In the 1960s Japan had extensive environmental problems. Yet by the 1970s Japanese companies, with support from national and local governments, were aggressively tackling environmental problems, producing some remarkable achievements. This argument is simplistic, however, because it ignores the important links between a healthy environment, workforce, and economy. It also ignores that some environmental resources—such as biodiversity—are irreplaceable.

In addition, the argument that most countries have only tackled environmental problems once they are rich is to some extent inaccurate. As the World Bank (1998a:108) notes, "developed economies did address some of the environmental problems associated with urbanization and industrial growth. They invested heavily in developing infrastructure for water supply and sanitation. Within the limits of the technologies available, they also tried to mitigate industrial pollution. In some respects Asian countries are still well behind the achievements reached 80 to 100 years ago by well-developed economies." This suggests that while donors should recognise the need to stabilise economies in the Asia-Pacific as quickly as possible, they should reject arguments that environmental investments must wait until governments and corporations can 'afford' them.

There is a need for donors to search for and support efforts to take advantage of the windows of opportunity offered by the crisis. This is especially critical in Indonesia where the source of much of the environmental mismanagement was the fusion among political, military, and business interests, often at the expense of local or marginalised peoples.

It is also important for donors to explore ways to mutually reinforce the objectives of economic stabilisation and environmental protection. The World Bank (1999:26) proposals are reasonable here.

- Facilitate "the removal of environmentally harmful subsidies and price controls (for example on fuels such as diesel)"
- Increase "the price of natural resources in connection with the introduction of other reform measures"
- Introduce "environmental taxes and charges as part of the fiscal reform."

Sharp economic downturns inevitably aggravate many existing environmental and social problems. Yet it is equally important to stress that resulting environmental and social problems can feed back and contribute to even greater economic problems, potentially creating a vicious cycle that would be hard to break. For example, the financial turmoil may leave governments unable to provide adequate water and sanitation services, especially for the poor. This will affect human health, straining the medical system, the workforce, and ultimately the economy. Another example of this vicious circle may occur as unemployed and destitute urban poor flee to rural areas. This will increase the pressures on local forests and agricultural land, which in turn may trigger more soil erosion, lowering agricultural productivity and overall economic performance. The longer the economic downturn lasts the worse this cycle could become as environmental conditions steadily deteriorate.

Industrial output and the environment

Falls in industrial output since mid-1997 will likely alleviate air pollution in the short-term. Yet without effective preventative measures, air pollution will likely worsen in the longer term. World Bank (1999:9) models suggest that atmospheric emissions from small sources, such as households and traffic, will increase at a faster rate than total emissions once growth resumes. This seems to indicate a need to focus on lowering pollution from small sources, especially in urban

areas. More specifically, the World Bank recommends (1999:10): "Phasing out two-stroke engines...Ensuring the complete phaseout of lead from gasoline...Encouraging the use of alternative fuels (for example, liquid petroleum gas and compressed natural gas) in high-use vehicles such as buses and trucks, and by urban households...Implementation of stricter vehicle inspection and maintenance programs...and Introduction of stricter diesel emission standards." These are all reasonable proposals for other donors to consider supporting.

The work of Shakeb Afsah dispels the notion that lower industrial production will automatically decrease pollution levels. This notion, sometimes put forth as self-evident, can itself contribute to problems as it justifies governments putting environmental issues "on the back burner" during times of economic crisis (Afsah 1998:6). It is important for donors to question this logic and in turn stress the need for more effective monitoring and enforcement of pollution regulations in times of crisis.

Currency devaluations, commodity exports, and the environment

Where market prices remain relatively strong, rapid currency devaluations throughout the region have created strong incentives for governments and firms to turn to agricultural and natural resource exports to generate vital foreign exchange. With a large portion of production and labour costs in local currency and revenue in foreign currency, some firms are even thriving in the context of the crisis, making windfall profits. The tendency of rapid currency devaluations to stimulate export-oriented natural resource

extraction and agricultural production is consistent with the trends in past devaluations of currencies, including Indonesia in the mid-1980s and Mexico in the early 1990s (Clay 1998:1).

The Asian financial crisis, as well as previous ones, show that rapid currency depreciations generally accelerate unsustainable natural resource extraction as well as export crop production (although some exceptions can occur, at least temporarily, when the consumer economies are simultaneously thrown into recession, such as log production in the first year of the Asian financial crisis or when global market prices fall sharply, such as with tiger prawns). Policies and measures to liberalise exports as governments seek foreign exchange and economic growth—such as lowering export taxes and lifting restrictions on foreign investment—can add to these pressures on natural and land resources. In this context, donors need to pay particular attention to trends in natural resource and agricultural management. It also makes sense for donors to support efforts to ensure that resource fees remain high, that governments collect sufficient economic rents, and that companies do not make windfall profits.

The political and social changes triggered by the crisis suggest an even greater need for international support for communities and emerging civil societies within the region. This includes support for the strong grassroots environmental movements in the Philippines as well as emerging community and environmental groups, such as those in Indonesia.

Communities, partly through informal regulation, can play a key role in monitoring and enforcing environmental regulations. This is especially important as state funds and commitment to environmental management wane. The financial crisis has strengthened the logic of supporting community participation and integration into efforts to enforce environmental regulations.

Related to the above two points, it is reasonable to assume that the crisis may be undermining social capital in the region. Social capital is "a type of social connectedness that facilitates the development of trust, cooperation, identifications, and norms of interaction, which in turn are crucial for decisive action—such as promoting economic growth or managing environmental resources" (Dauvergne 1998c). Specific forms of social capital include families, churches, neighbourhoods, trade unions, and voluntary associations. New migration patterns, rising poverty and unemployment, and new winners and losers can all strain social capital. Donors can potentially play an important role in trying to help communities maintain and perhaps even strengthen social capital (or in a worse case scenario deal with the consequences of less social capital).

Donor support for environmental projects, NGOs, and regional cooperation

The overall environmental effect of the crisis demonstrates the importance of past and current support from bilateral and multilateral donors for environmental projects. This has become especially critical as government priorities and support shift away from environmental protection and improvement.

The crisis reinforces the need for all aid projects—including environmental ones or ones with environmental effects—to stress accountability, good governance, transparency, and sound financial management. In addition, it further reinforces the need for organisational and financial reforms to build and rebuild the institutional capacity of recipient governments.

Governments and some corporations in the region are now stressing more efficient use and allocation of resources, primarily for economic reasons. Donor support for these efforts could produce significant environmental benefits.

It is logical for donors to support urban water, sanitation, and waste disposal systems. This would especially help the urban poor, many of whom have been severely affected by the crisis. This

would also help create jobs (and thus help stem migration to rural areas) as well as provide critical services for some of the poorest people. These efforts in turn would have important spillovers for overall environmental quality.

It is equally logical to support rural infrastructure. This will help alleviate some of the pressure on rural communities as people leave the cities in search of food and jobs. With the exit of so much private capital from the region, recipients will also need additional funds for general infrastructure development—such as transportation and communication. This provides donors with the potential to increase their influence over the environmental management of rural development.

There is a corresponding need for donor support for rural employment. This could combine with initiatives to improve rural environmental conditions, such as community reforestation or soil conservation projects. It could also involve, for example, support for small-scale industrial development or microfinancing. While supporting rural employment in itself will have important environmental benefits, it is nevertheless crucial to address the environmental impacts of particular projects.

The ability and willingness of governments in the Asia-Pacific to fund environmental programs have naturally decreased during the crisis. For donors, this means less counterpart government funding is available for aid projects. This suggests that donors may need to consider finding additional funds from other sources, or perhaps requesting non-financial counterpart funding. Another possibility is to reallocate funds from aid projects that are no longer viable or desirable given the crisis. This further suggests that donors now have a greater opportunity to influence the environmental policies and programs of cash-strapped governments in the Asia-Pacific.

Related to the previous point, governments now have greater incentives to deal with 'brown' issues—such as water quality, air pollution, and sanitation. Addressing these brown issues also provide more immediate benefits for the increasing number of poor people in the region. Green issues like biodiversity, wildlife protection, or national parks naturally receive less government and societal support. Donors may want to consider promoting and supporting more green projects, even when this involves less counterpart support. These projects are often relatively cheap, create jobs (through reforestation, for example), and protect irreplaceable environmental resources, such as old-growth forests and biodiversity.

The rapid changes brought on by the crisis adds to the need for donors and recipients to build mechanisms to respond to sudden changes to the original conditions that underpinned aid agreements or projects. Recipients are struggling to coordinate, implement, as well as approve aid projects faster. Limited capacity and the need to integrate with larger aid projects leaves small bilateral donors especially constrained here.

The crisis reinforces the need for cooperative transregional efforts to address environmental degradation, such as working with ASEAN. The 1997 forest fires highlighted the need for regional responses. It is logical for donors to support efforts to strengthen the capacity of existing regional institutions, build networks of regional environmental cooperation, and promote cooperative efforts with other regional development organisations. This has the potential benefit of maximising the impact of limited amounts of aid.

Support for monitoring, enforcement, and market/community incentives

Recipients in Asia, more than ever, need support from donors to monitor and enforce environmental regulations, such as checking the waste disposal practices of specific factories. This is critical as corporations evade regulations to cut costs (such as factories dumping untreated waste) and as government resolve and capacity to enforce regulations declines. One example of this kind of initiative is the technical assistance

provided in 1998 by the US-Asian Environmental Partnership for Indonesia's Environmental Impact and Management Agency (BAPEDAL) to inspect the pollution and hazardous waste disposal practices of about 50 factories (Afsah 1998:9).

There is a need to support efforts to build stronger institutions and regulatory systems—both domestic and regional—that will promote better environmental management. As the World Bank (1998a:109) correctly notes: "The financial crisis is only a transient event. The critical question for the environment is whether growth will be 'business as usual' or will reflect fundamental reforms in both the economic and environmental spheres. The linkages between the economy and environment cannot be managed as directly as financial problems. Solutions require the strengthening of regulatory, institutional, technical, and managerial capacity with an emphasis on cross-sectoral coordination and consensus. Building such capacity and fostering change will require a prolonged effort and proper incentives."

At this point, there is insufficient evidence to determine whether environmental protection is absorbing disproportionate budget cuts, although some analysts appear to support this conclusion. Indisputably, however, with fewer funds available total governmental expenditures on environmental protection have fallen significantly. The drop in funding, along with cuts to subsidies, will affect the poor disproportionately, especially as environmental services such as water and sanitation deteriorate. Clean water and effective sanitation require expensive infrastructure and maintenance and are therefore particularly vulnerable in times of fiscal restraint. Developing effective metering and pricing systems to improve water management will also be costly. In addition, budget cuts will directly undermine attempts to monitor and regulate environmental management. The recommendation of the World Bank (1999:27) is appropriate here: To review and monitor public expenditures, while emphasising protecting "expenditures with simultaneous social and environmental benefits"...as well as identifying "alternative revenue sources and mechanisms to maintain key environmental management functions."

Related to the above points, as long as the crisis lasts, market and community incentives need to play an increasingly important role in controlling corporate activities, as financial instability undercuts government capacity (Afsah 1998:1-9). Possible options include eco-labels, emission and user charges, environmental taxes, and tradeable pollution rights. More specifically, possible measures could include developing a tax regime that encourages drivers to switch to unleaded petrol. The general overhaul of economic management that is accompanying the Asian crisis provides a potentially important opportunity for donors to help governments integrate these environmental measures. Implementing these incentives will be difficult, however. Dennis Zvinakis, of the US-Asia Environmental Partnership, sums up the dilemma here: "Certainly the financial crisis does make it difficult to introduce user pay strategies, but the same crisis makes it even more difficult to sustain large government subsidies. I find it hard to see a third way. Growth in Asia and the amount of available capital may have declined, but urbanisation and the demand for urban services continues relentlessly" (Asia Environmental Trading 1998a:3).

Market and community-incentive approaches are generally cheaper, more decentralised, easier to administer, and more flexible than direct regulation. They also have the potential to address market failures, such as export and consumer prices that externalise environmental and social costs. This can help regulate the quantities and prices of natural resource exports, for example. The drawback of these instruments is that corporate interests may capture them. In other words, they could become a tool of corporate expansion rather than a tool for environmental protection. Political intervention can also create unexpected outcomes, or at least outcomes that do not match the theoretical prediction. Yet, perhaps most importantly, they also have the potential to

raise vital revenue for the governments. Once the crisis ends, these market and community incentives would presumably remain important even as government capacity rises again.

The capacity of governments to address significant environmental problems is restrained even at the best of times. During a sharp economic downturn this becomes even more restrained, especially when the immediate costs of clean up are high. This suggests that governments and donors should stress that new enterprises use clean technology and stress pollution prevention. It further suggests that donors should consider supporting initiatives to transfer appropriate environmental technologies to prevent pollution.

Further research

The financial crisis in Asia is far from over. So are the environmental effects of the crisis, which will continue long after the financial crisis ends. As a result, for now conclusions must remain tentative. One important finding of this report is that relatively few studies have been done on the environmental effects of the Asian financial crisis. Moreover, there is a need to coordinate and synthesise the studies that have been done or are now under way. Distributing this report widely among the donor and nongovernmental community will hopefully provide an important starting point for more detailed studies.

Donors may want to consider funding further research efforts on the environmental effects of the crisis. Detailed studies are essential because of the significant sectoral, temporal, and spatial variations that arise when assessing the environmental effects of the financial crisis. There is a need to systematically document the changes to waste disposal, water use, logging, fishing, mining, and agricultural practices. There is also a need to monitor environmental laws and budgets (especially the reallocation of resources within environmental agencies), and then examine the impact on environmental conservation, protection, and enforcement. Further research on the environmental implications of changing trade and investment patterns is also necessary. It is equally critical to integrate specific research findings.

Tracking environmental changes as they happen would help governments respond while the crisis is still in progress. Waiting until the crisis ends—and conclusive data are available—may well make it too late to respond effectively.

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