

1 Introduction¹

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 of the Philippine Institute for Development Studies noted in April 1998: 'Asia is the most polluted and environmentally degraded region in the world' (Intal and Medalla 1998: 1; for details see Asian Development Bank 1997; Merson 1998).

Loggers have degraded much of the old-growth tropical forests in the Asia-Pacific, contributing to widespread deforestation (Dauvergne 1998b). Forest fires have burned huge areas, and in the case of the 1997 fires in Kalimantan and Sumatra, spread a choking haze across South-East Asia. Deforestation and soil erosion have contributed to agricultural degradation and devastating floods. Vehicle lead emissions in Asia are now well above World Health Organisation (WHO) 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 South-East 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 have added to these environmental problems. The population in Asian megacities, for example, is expected to more than triple from 1995 to 2025, from 126 million to 382 million (Asian Development Bank: www).

The environments of the Asia-Pacific, then, were highly vulnerable when the economies throughout the region began crashing in mid-1997. The crisis – both in the short and long-terms – is exacerbating many existing environmental problems, as well

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The Environmental Implications of Asia's 1997 Financial Crisis

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as creating additional ones. It has both direct consequences as well as indirect implications as a result of adjustments and policy reforms. The resulting environmental degradation now occurring is feeding back and worsening the economic and social problems, creating a cycle that will be hard to break. Without preventative measures, a second crisis – one that centres on environmental collapse – could well be on the horizon.

Simple calculations, however, 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 that as the lens and levels of analysis move, and as the underlying prioritisation of concerns shifts, the conclusions regarding the net costs naturally vary. Recognising these complexities means accepting that both effects and interventions will have multiple interrelated repercussions.

This article examines the environmental implications of the crisis for agriculture, fishing, conservation, air and water pollution, and forests in South-East Asia and Melanesia, covering the period from mid-1997 until early 1999. It pays particular attention to the importance of changes to employment, income, global and regional trade, migration patterns, and global budgets and priorities. To begin, the next section provides a sketch of the crisis.

2 Asia's Financial Crisis

In 1997 Asian currencies began to crash, triggering financial crises throughout the region. The specific causes of the economic crises vary considerably across and within countries. A large number of studies have already been done on the causes (see Bello 1998; Gates 1998; Griffith-Jones 1998; Krugman www; Roubini www). At the most general

level these studies show that an interlinked mix of factors sparked the crisis. These 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 nonconvertible 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 per cent. Unemployment skyrocketed. In 1997 and 1998 the Indonesian rupiah depreciated, at times fluctuating wildly. In July 1997 it was around Rp2,450 to the US dollar; by September 1998, it was around Rp11,000 to the US dollar. Over this time, prices for essential goods soared in Indonesia. 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).

These changes will affect ordinary Indonesians well past the end of the financial crisis. The United Nations International Children's Emergency Fund (UNICEF) estimated in October 1998 that the crisis had pushed at least half of all Indonesian children under two into malnourishment, while 65 per cent of children under three had become anaemic. Coupled with the rapid rise in school drop-outs and falling health standards, according to UNICEF, the intellectual ability of an entire generation is now threatened (Williams 1998: 1).

The next section reviews some of the social implications of the crisis, paying particular attention to the impact on environmental management in Indonesia, where the crisis has had the greatest impact.

3 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 resources like forests and water. In Indonesia, for example, the director-general of Forest Conservation and Protection noted in August 1998 that increasing numbers of people are pillaging forests to survive (Sunderlin 1998).

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 has also 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 Indonesian government has encouraged migration back to the countryside by, for example, making it relatively cheap for over three million urban workers to return home for the 1997-8 Ramadan holiday. One indication of the trend 'back to the countryside' 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).

Greater 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 may expand production, 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.

4 Agricultural Expansion

Sunderlin (1998: 2) points to five main reasons why expanding and supporting agriculture is an attractive response to the economic and social effects of Asia's financial crisis. First, the agricultural sector is less dependent on foreign currency inputs; therefore, the 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, especially when facing strong social pressures, as in Indonesia. 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. In this way agricultural employment is a '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 the local currency allows countries like Indonesia to sell agricultural goods on the international market much more cheaply in terms of US dollars – this is 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 October 1998, Indonesia's forestry and plantation minister reiterated the government view that agribusiness was an important engine to help pull Indonesia out of the economic downturn (Antara 1998b). This will generate great environmental pressures, however, especially the development of palm oil estates (examined later in the article). Moves to increase the production of cocoa, coffee, shrimp, rubber, and pepper will add to these pressures.

For example, 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.

5 Fishing and Conservation

Fisheries 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 'substantial over-harvesting of aquatic resources' in the region (World Bank 1999: 15).

As with agricultural exports, promoting fisheries exports is a logical response to the currency devaluations. 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 1998a). He 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. 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 now receive (Antara 1998a).

The financial crisis has 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, despite severe damage to coral reefs, the use of dynamite to sweep fish from a specific area appears to be increasing. 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 appears to be an increasing number of smaller, owner-operated fishing boats in Indonesia. More fishers may also be involved in poaching. Some 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 may also be encouraging fishers to stay closer to shore or move to new locations, to some extent altering their type of catch.

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 could simultaneously push consumption down). Further research is necessary to determine the potentially positive and negative implications of all of these changes for biodiversity and fish stocks.

Finally, the financial crisis appears to be increasing the pressures on endangered animals and national parks. In Indonesia, local wildlife has become an increasingly important food source. Rare wildlife, some from the remotest areas of the country, are now being sold at local markets. Wildlife, such as endangered macaques, have been sold to foreign fishers for food. Biologist Rob Lee 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).

6 Air Pollution

The air of many Southeast Asian cities is severely polluted. In the mid-1990s the United Nations Environment Programme (UNEP) 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 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 operate, although this still needs to be statistically verified.

The World Bank (1998a: 105) predicts that by the year 2000 the crisis will lower particulate emissions in Indonesia by 17 per cent and lead by 20 per cent 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 can bring newer and cleaner technologies – slows. Moreover, industries that remain will have less capital to invest in environmental technologies. Firms will also likely sidestep environmental, health, and safety standards to reduce costs. Finally, the crisis has undermined the ability and willingness of governments 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 per cent in 2005.’

At the same time, fewer government subsidies for fuel – such as the ones 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 may be impractical since it has potentially explosive political and social repercussions, as the riots in Indonesia following the fuel price hikes on 5 May 1998 demonstrated. The Indonesian government abandoned these measures within a week.

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).

7 Water Pollution and Sewage

Unlike particulates and lead, the financial crisis has in some cases apparently worsened 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.

Irrigation systems in South-East Asia are often unreliable and urban water supplies are often filthy, in part because of poor sanitation facilities. The Asian Development Bank (1997) estimated that ‘Despite rapid and steady growth in income and wealth, at least one in three Asians still has no access to safe drinking water, and at least 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. Shakeb Afsah, senior policy advisor to US–Asia Environmental Partnership, estimated that the financial crisis had lowered monthly output of industrial plants in Indonesia by 18 per cent in the second half of 1997. Yet over this time the amount of organic waste per unit of industrial effluent jumped by over 15 per cent, apparently because more factories simply dumped untreated waste. As Afsah (1998: 1) notes, ‘This finding contradicts the simple view that slower, lower or negative economic growth will reduce industrial pollution. On the contrary, pollution may increase because factories adjust their abatement effort in response to the lower regulatory inspection and enforcement, and higher pollution control costs.’

Afsah’s work supports the argument that water pollution is now rising in some locations as firms exploit weaker government efforts to monitor and enforce regulations. It further points to the strong possibility that illegal dumping of toxic wastes may also be increasing. Clapp (1998: 25) examines Afsah’s study and concludes 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 per cent and in the Philippines by 800 per cent (Salim 1998).

Aggregate figures do not of course reveal shifts in the specific location of water pollution. Even if the amount of water pollution rises overall, some communities may well benefit from the closure of an environmentally destructive firm, such as when the textile plant in Lagadar village in Indonesia, with a reputation for dumping waste into the nearby river, closed in mid-1998 (Yamin 1998).

8 Tropical Timber

8.1 Short-term implications of collapse in demand

A drop in demand and prices for Asian tropical timber contributed to sharp falls in exports and production in 1997 and 1998. Demand for tropical logs in South Korea and Japan fell partly in response to the domestic recessions and the slowdown in construction. 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. The value of log exports from Papua New Guinea fell by US\$134 million in the first half of 1998, down to only US\$57 million. Over 40 timber operators halted production (Brunton 1998a).

This drop in demand has provided the Solomon Islands and Papua New Guinea with 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 Asian financial crisis may have been a blessing, ending the '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 1998–9). 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. Many companies simply stockpiled logs. By the end of 1997 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).

A similar situation has arisen in Indonesia. Almost 6 million cubic metres of uncollected logs lay in the forests in early 1998. In October 1998, Sudradjat, the chair of the Indonesian Forestry Society, estimated that at least 40 per cent of Indonesia's companies involved in timber production were considering shifting to more lucrative businesses (Cable News Network 1998).

Important policy and administrative changes are now occurring to Indonesian forest management. 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. (Apkindo, under the control of President Suharto's crony Bob Hasan, has dominated Indonesia's timber industry over the last decade.) The government has 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 has announced plans to review the use of the Reforestation Fund, little of which has actually supported reforestation.

These changes, 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 has already contributed to extensive environmental damage. Some reforms will have mixed environmental effects, such as removing restrictions on foreign direct investment in the palm oil industry and efforts to liberalise the timber trade. Some reforms may partly be illusory, as informal rules and connections continue despite formal changes (as appears to be partly the case for Apkindo). Moreover, government commitment to implement reforms is inconsistent. By late 1998 the World Bank had become so dismayed with the lack of progress by the Indonesian government to

reform forest management that it suspended payment of a US\$400 million loan.

Finally, although the drop in regional demand for tropical wood has relieved some of the immediate commercial pressure on old-growth forests, it has simultaneously decreased government revenues, 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 sales have had especially traumatic economic effects.

8.2 Long-term environmental effects on forests

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

Indonesia's timber industry appears to be rebounding. Chinese demand for Indonesian plywood started to surge in April 1998 after a new Chinese government policy to reduce logging by 60 per cent. 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 are now hiring mill workers back. And, although total plywood exports for 1998 fell somewhat, the forest industry as a whole has apparently come close to meeting its export target of US\$8.3 billion, partly on the strength of the pulp and paper industry (Sunderlin 1998: 3; Akella 1999: 79). Moreover, new migrants to rural areas, governments and firms have strong financial incentives to clear land and forests. The financial crisis is also making it far more difficult for governments to monitor and enforce environmental policies as well as control illegal logging.

A pessimistic 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 1981–5 estimated that on average each 1 per cent fall in the exchange rate was tied to a 1.4 per cent jump in the deforestation rate (Capistrano and Kiker 1995, summarised in World Bank 1999: 12).

Finally, some of the greatest future pressures on the remaining forests of the Asia–Pacific will come from the rapid expansion of plantations.

9 Plantations

As noted earlier, the financial crisis has generated strong incentives to develop more large-scale plantations. Forest plantations covered around 3.8 million hectares of Indonesia in 1994. This may have reached almost 8 million hectares by the end of 1998 (Yoga 1998). The future will likely see even more plantations. The government aims to make Indonesia one of the world's top pulp and paper producers. The government has a similar goal to overtake Malaysia as the largest producer of palm oil (used to make margarine, cooking oil, and soap). This is an ambitious goal considering that Malaysia is also 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 per cent increase in net profits during the second half of 1997. In 1998, the value of Malaysian palm oil exports was expected to reach M\$15 billion, more than \$5 billion higher than the previous year (McNulty 1998).

Indonesia is, however, already 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, palm oil plantations grew from 600,000 hectares to around 2.2 million hectares. 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 project in central Kalimantan towards palm oil instead of food production (Down to Earth 1998). By 2005, the Indonesian government hopes to increase the area for palm oil production to 5.5 million hectares (*CIFOR News* 1998: 9).

The push to build palm oil plantations 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 have remained low, allowing firms to make windfall foreign exchange profits. Firms can also make substantial profits by clearing the land of

valuable timber before planting. Indicative of its profitability during the crisis, in February 1998 the plantation sector shares on the Indonesian stock market jumped almost 30 per cent (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' (*The Star* 1998). So far, however, the greatest environmental impact of plantation companies has been their direct role in lighting the forest fires of 1997 and 1998 that swept Indonesia's outer islands. Klaus Topfer, executive director of UNEP, remarked in April 1998 that Indonesia's 'forest fires may turn out to be one of the greatest ecological disasters of the millennium' (for details, see Dauvergne 1998a).

10 Conclusions and Recommendations

The environmental implications of the crisis are diverse and multifaceted. Careful qualifications must accompany broad conclusions and generalisations. While highlighting these generalisations, the final section outlines some important policy implications of the early evidence of the environmental implications of the Asian financial crisis.

- Re-establishing economic stability is critical to the process of improving environmental conditions. Otherwise, environmental reforms will have great difficulty receiving the necessary government and business support.
- Yet governments, companies, and donors must not wait until the Asian financial crisis is over before addressing environmental problems. The socio-economic and environmental problems triggered by the crisis must be tackled simultaneously. A healthy environment, workforce, and economy are inextricably linked. Moreover, it is essential to recognise that some environmental resources – such as biodiversity – are irreplaceable.
- There is a need for governments and donors to search for and support efforts to take advantage of the window of opportunity offered by the crisis. This opportunity is especially great in Indonesia, where the source of much of the environmental mismanagement was the fusion of political, military, and business interests, often at the expense of local people.
- 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 downward cycle that is 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.
- Falls in industrial output since mid-1997 have apparently alleviated air pollution in the short term. Yet without effective preventative measures, air pollution will likely worsen in the longer term. There is a particular need to focus on lowering pollution from small-scale sources, especially in urban areas.
- Shakeb Afsah's research on water pollution in Indonesia shows that lower industrial production does not automatically decrease pollution levels. This notion, sometimes put forth as self-evident, can itself contribute to problems as it justifies putting environmental issues 'on the back burner' during times of economic crisis (Afsah 1998: 6). It is important to question this logic and in turn stress the need for more effective monitoring and enforcement of pollution regulations in times of crisis.
- Where market prices remain relatively strong, rapid currency devaluations throughout the region have created strong incentives for governments and firms to expand agricultural and natural resource exports to generate foreign exchange. With a large portion of production and labour costs in local currency and revenue in foreign currency, some resource 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).

- There are, however, some exceptions to this generalisation – at least temporary ones – when the consumer economies are simultaneously thrown into recession. This occurred for tropical log production in the first year of the Asian financial crisis when demand crashed in Japan and South Korea.
- The political and social changes triggered by the crisis suggest an even greater need for international support for communities and emerging civil societies within Asia. This includes, for example, support for established 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.
- Given the environmental implications of the financial crisis so far, it is logical to support improving urban water, sanitation, and waste disposal systems. This would especially assist 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 the development of 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, Asia–Pacific governments will need external funds for general infrastructure development – such as transportation and communication. This provides official donors with the potential to increase their influence over the environmental management of rural development.
- There is a corresponding need to stimulate rural employment. This could combine with initiatives to improve rural environmental conditions, such as community reforestation or soil conservation. It could also involve, for example, support for small-scale industrial development or microfinancing. In this context, it is sensible to support efforts to improve social conditions of communities near fragile ecosystems. While supporting rural employment in itself will have important environmental benefits, it is nevertheless crucial to address the environmental impacts of particular projects.
- Many governments in the Asia–Pacific now have greater incentives to deal with ‘brown’ issues – such as water quality, air pollution, and sanitation. Addressing these brown issues also provides 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. International and regional support for green projects is now especially critical. 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 crisis reinforces the need for cooperative transregional efforts to address environmental degradation, such as working with the Association of South-East Asian Nations (ASEAN). The 1997 forest fires in Kalimantan and Sumatra highlighted the need for regional responses. It is logical 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.

- Governments in Asia, more than ever, need support 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.
- 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. In addition, budget cuts will directly undermine attempts to monitor and regulate environmental management.
- Related to the above points, as long as the crisis lasts, market incentives need to play an increasingly important role in controlling corporate activities, as financial instability undercuts government capacity. Possible options include ecolabels, emission and user charges, environmental taxes, and tradeable pollution rights. Market approaches are generally cheaper, more decentralised, easier to administer, and more flexible than direct regulation. These instruments, however, must be used judiciously to prevent corporations from capturing them and political intervention from creating unexpected outcomes.
- The crisis has contributed to and occurred alongside a general trend toward decentralisation, including devolution of environmental management to local and regional authorities. Indonesia plans to further devolve powers to the 27 provinces, including granting a larger share of natural resource proceeds (Sim 1998). These institutions need support to handle these new responsibilities. Donors and non-governmental organisations can help build the capacity of these institutions to manage environmental issues, including technical as well as financial support.
- It is important to stress that so far relatively little research has been done on the environmental implications of the Asian financial crisis. This partly reflects the limited amount of reliable data available, although some patterns and trends have emerged. Detailed research is required on changes to water quality, industrial pollution, 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 is affecting conservation and enforcement. Finally, further research is necessary to understand the mixed environmental implications of changing trade and investment patterns.

References

- Afsah, S. (1998) 'Impact of financial crisis on industrial growth and environmental performance in Indonesia', July, at <http://www.worldbank.org/nipr/work-paper/shakeb/index.htm>
- Agence France-Presse via Pacific Islands Report (1998) 'Solomon Islands to end unsustainable use of forests', 27 October.
- Akella, A.S. (1999). 'The East Asian financial crisis: evolution and environmental implications for Indonesia,' Jakarta: Macroeconomics for Sustainable Development Program Office, World Wide Fund for Nature, WWF.
- Antara (1998a) 'Indonesia may become world's biggest exporter', 26 October.
- Antara (1998b) 'Agribusiness playing important role in boosting RI's exports', 27 October.
- Asia Environmental Trading (1998a) *Asian Environmental Review*, September.
- Asian Development Bank, at <http://www.asiandevbank.org/megacity/summary.htm>
- Asian Development Bank (1997) *Emerging Asia: Changes and Challenges*, Manila: Asian Development Bank.

- Baillie, T. (1998) 'Indonesian women and the Asian crisis', a study for the Gender and Education Group, Canberra, AusAID, July.
- Bello, W. (1988) 'The end of a "miracle": speculation, foreign capital dependence and the collapse of the Southeast Asian economies,' *Multinational Monitor*, Vol 19, Nos 1&2, January/February, at <http://www.essential.org/monitor/mm1998/mm9801.05.html>
- Brunton, B.D. (1998a) 'Papua New Guinea: forest update', Greenpeace Pacific, September.
- (1998b) 'Greenpeace Pacific forest update: Papua New Guinea', Greenpeace Pacific, 30 December.
- Cable News Network (1998) 'Many timber firms facing closure in Indonesia', 6 October.
- Capistrano, A.D., and C. F. Kiker (1995) 'Macro-scale economic influences on tropical forest depletion', *Ecological Economics*, Vol.14, No.1: 21–9.
- Central Bank of Solomon Islands (CBSI) (1998) *1997 Annual Report*, Honiara: CBSI.
- CIFOR News (1998) Center for International Forestry Research, No.20, September.
- Clapp, J. (1998) 'Hazardous waste and human security in Southeast Asia: Local – global linkages and responses', draft paper for the Development and Security in Southeast Asia (DSSEA) Project, Conference in Manila, the Philippines, 15–19 December.
- Clay, J. (1998) 'Indonesia's currency crisis and threats/opportunities for conservation', World Wildlife Fund, 1 February, draft.
- Cubol, E. (1998) 'Development, security, and industrial pollution in the Philippines', draft paper for the Development and Security in Southeast Asia (DSSEA) Project, Conference in Manila, the Philippines, 15–19 December.
- Dauvergne, P. (1998a) 'Burning down Indonesia: the politics of forest fires', *The Asia-Pacific Magazine*, No. 11: 34–7.
- (1998b) 'Globalisation and deforestation in the Asia-Pacific', *Environmental Politics*, Vol.7, No.4 (Winter): 113–34.
- (1998–99) 'Corporate power in the forests of the Solomon Islands', *Pacific Affairs*, Vol.71, No.4 (Winter): 524–46.
- Down to Earth (1998) 'Bank report exposes chaos at Central Kalimantan mega-project', *Down to Earth*, No. 39, November.
- Emilia, S., (1998) 'Crisis forces Jakarta to sacrifice its environmental programs', *Jakarta Post*, 2 July.
- Gates, C.L. (1998) 'The East Asian crisis: causes and dynamics', *Development Bulletin*, Vol.46 (Winter 1998): 7–10.
- Griffith-Jones, S., with J. Cailloux, and S. Pfaffenzerler (1998) 'The East Asian financial crisis: a reflection on its causes, consequences and policy implications', *Institute of Development Studies Discussion Paper 367*, at <http://www.ids.susx.ac.uk/ids/publicat/dp367.html>
- Inchukul, K. (1998) 'Tighter controls to counter pollution', *Bangkok Post*, 30 December.
- Intal, P. Jr., and E. Medalla (1998) 'The East Asian crisis and Philippine sustainable development', Plenary Paper, Economy and Environment Program For Southeast Asia, prepared for the Forum on the Asian Financial Crisis and Sustainable Development at the Sixth Session of the United Nations Commission on Sustainable Development, New York, 22 April.
- Jakarta Post* (1996) 'Integrate a 'green GDP' into development', 26 December.
- Krugman, P. (1998a) 'Will Asia bounce back?' Speech for Credit Suisse First Boston, Hong Kong, March, at <http://web.mit.edu/krugman/www/suisse.html>
- *www*. See various articles at <http://web.mit.edu/krugman>
- Lamb, D. (1998) 'Indochina finds it's not immune to Asia crisis', *Los Angeles Times*, 15 February.
- McNulty, S.,(1998) 'Palm oil gives Malaysia helping hand: nature is a saviour', *The Financial Times*, 12 June.
- Merson, J. (1998) 'Asia's environmental crisis: Innovation, sustainable development, and the future of APEC', *Asian Perspective: A Journal of Regional and International Affairs*, Vol.22, No.2: 79–104.
- Robie, D. (1998) 'PNG [Papua New Guinea] loggers laughing all the way to the bank', *Pacific Islands Report*, 27 December.
- Roubini, N., 'What Caused Asia's Economic and Currency Crisis and Its Global Contagion?' at <http://www.stern.nyu.edu/~nrubini/asia/AsiaHome page.html# social>
- Salim, E. (1998) 'Environment key to sustaining recovery in Asian economies', *South China Morning Post*, 18 March.
- Seneviratne, K. (1998) 'Asian crisis slows logging, swells economic woes', InterPress Service, 28 September.
- Sim, S. (1998) 'Jakarta to offer greater regional autonomy', *Straits Times*, 28 December.
- The Star* (1998) 'Villagers worry about river pollution', 16 October.

- Sunderlin, W.D. (1998) 'Between danger and opportunity: Indonesia's forests in an era of economic crisis and political change', 11 September at <http://www.cgiar.org/cifor/>
- Tangprasert, P., and N. Ratchasima (1999) 'Jobless farmers issue dire threat', *Bangkok Post*, 25 January.
- Wall Street Journal* (1998) 'Poverty-stricken Indonesians turn to native animals to survive', November.
- Williams, L. (1998) 'Starving children a lost generation', *The Sydney Morning Herald*, 20 October.
- World Bank (1998a) 'Environment in crisis: a step back or a new way forward?' in *East Asia: The Road to Recovery*, Washington, D.C.: World Bank.
- (1998b) 'What effect will East Asia's crisis have on developing countries?' *PremNotes*. No.1 (March).
- (1999) *Environmental Implications of the Economic Crisis and Adjustment in East-Asia*, Washington, D.C.: East Asia Environment and Social Development Unit, *Discussion Paper Series* No. 01.
- Yamin, K. (1998) 'Environment bulletin—Indonesia: Crisis yields 'green' gains', *InterPress Service*, 5 September.
- Yoga, S.S. (1998) 'An open aid to destruction', *Star Publications*, 17 November.