Development Dilemmas

Source: *Tantyo Bangun-Indo Pix; Corbis*

Chapter Three

Communities, Markets, and Public Information

Sumatra, a huge island in the Indonesian archipelago, is home to the world's largest flower, Asia's largest volcanic lake, and indigenous peoples whose distinctive villages dot the volcanic highlands and forested lowlands. Sparsely populated and resource rich, Sumatra lies across narrow straits from Malaysia, Singapore, and the Indonesian island of Java. As their neighbors joined the East Asian miracle during the 1970s, the people of Sumatra found themselves squarely in the path of onrushing development. They stood their ground in a succession of conflicts over land use, resource exploitation, and environmental degradation. Some of these conflicts ended tragically, leaving social and environmental destruction in their wake. But some also ended happily, defining progressive new roles for government, business, and local communities.

The success story of PT Indah Kiat Pulp and Paper (IKPP) offers some insights into these new roles.[1] The largest pulp producer in Indonesia, IKPP is also the cleanest. Its mill at Tangerang, West Java, has received several national and international environmental awards, and its Sumatran mill at Perawang is fully compliant with national pollution regulations.

But IKPP wasn't always an environmental paragon. In 1984, its Sumatran operation began by importing an outdated factory from Taiwan (China) that employed elemental chlorine and discharged its

wastes into the Siak River after minimal treatment. Round one of the mill's cleanup began in the early 1990s, with a backlash from local villagers. Allying themselves with local and national NGOs, the villagers claimed severe health damage from the mill's emissions and demanded more pollution control and compensation for their losses. In 1992 Indonesia's national pollution control agency, BAPEDAL, mediated an agreement in which IKPP acceded to the villagers' demands.

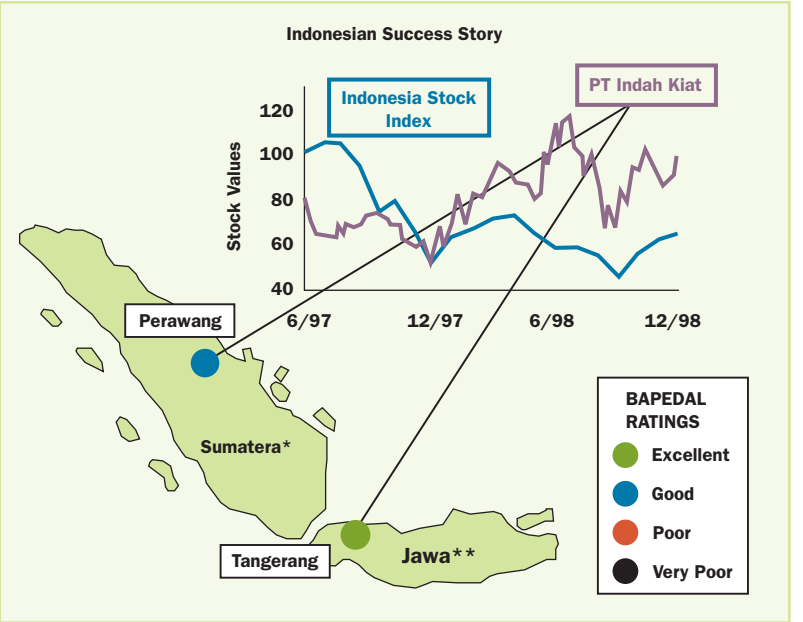
As this settlement was concluded, Indonesia's export boom ushered in round two for the mill. To finance a huge expansion in capacity, IKPP needed access to Western bond markets on favorable terms. Faced with potential concern in these markets over the company's long-term liability for pollution damage, IKPP managers opted to make a high-profile investment in clean production. The new facility uses world-class technology that is largely chlorine free and could be converted to totally chlorine-free production. IKPP has absorbed this technology easily because its parent corporation has a large, sophisticated engineering staff. What's more, IKPP has shown that large-scale clean production can be profitable in a developing country. Its performance has been so good that the company's stock value has increased while the Jakarta composite stock index has plunged 60 percent during the country's current financial crisis (Figure 3.1).

The PT Indah Kiat saga illustrates a new model for pollution control in developing countries. Formal regulation had little to do with pollution reduction at the Perawang mill. Defending their own interests, local communities applied pressure for cleanup and compensation. Abandoning the traditional agency role, BAPEDAL acted as a mediator rather than as a dictator of environmental standards. Later, pressure from international financial markets propelled IKPP to the next level of environmental performance.

In our basic terminology, local and international forces confronted IKPP with growing marginal expected penalties (MEP), even though government regulation was weak. Because it was a large branch facility of a sophisticated multiplant firm, the Perawang factory had relatively low marginal abatement costs (MAC). Faced with rapidly rising MEP and low MAC, IKPP's managers opted for a quick reduction in pollution intensity.

In this chapter we will argue that the forces that influenced IKPP—links among local communities, market agents, and regulators—have sparked several of the world's most innovative experiments in environmental policy in countries where traditional regulation has failed. These creative programs harness the power of public information, enabling communities and markets to exert maximum

Figure 3.1 Clean, Profitable Production



*English: Sumatra
**English: Java

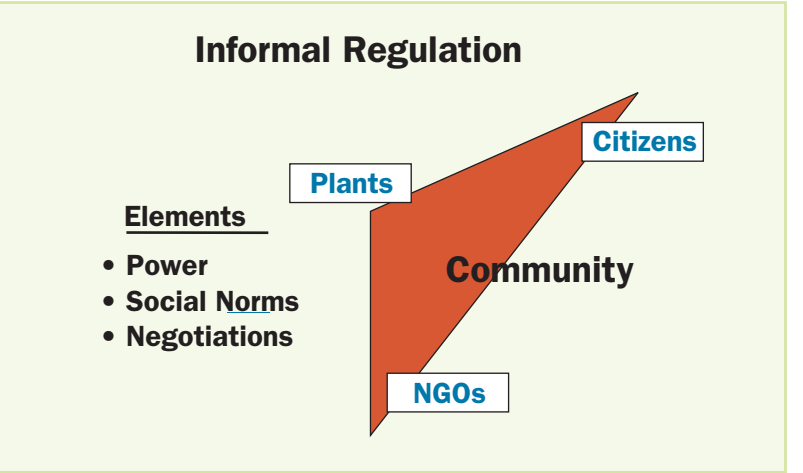
influence on polluters. The results suggest that such pioneering efforts can have a significant impact on industrial pollution in developing countries.

3.1 Communities as Informal Regulators

Abundant evidence from Asia, Latin America, and North America shows that neighboring communities can strongly influence factories' environmental performance.[2] Where formal regulators are present, communities use the political process to influence the strictness of enforcement. Where regulators are absent or ineffective, NGOs and community groups—including religious institutions, social organizations, citizens' movements, and politicians—pursue informal regulation by pressuring polluters to conform to social norms (Figure 3.2). Although these groups vary from region to region, the pattern is similar everywhere: Factories negotiate directly with local actors in response to threats of social, political, or physical sanctions if they fail to compensate the community or reduce emissions.

Indeed, communities sometimes resort to extreme measures when sufficiently provoked. In the *Asian Survey*, Robert Cribb has

Figure 3.2 Communities and Polluters



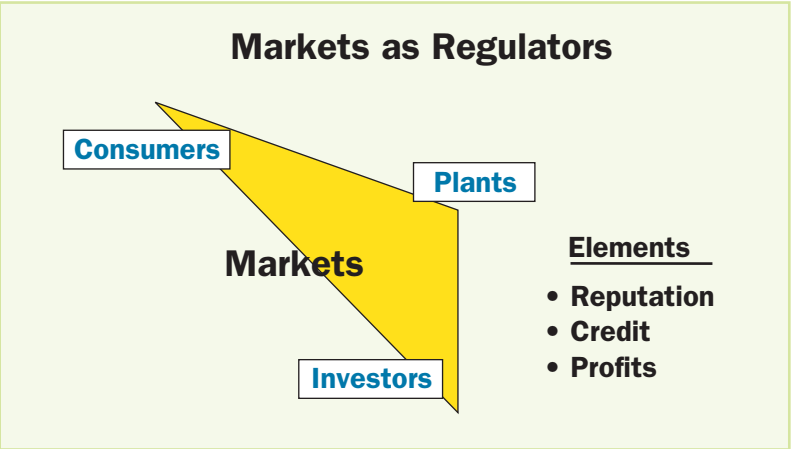
recounted an Indonesian incident "reported from Banjaran near Jakarta in 1980 when local farmers burned a government-owned chemical factory that had been polluting their irrigation channels." In a similar vein, Mark Clifford has reported in the *Far Eastern Economic Review* that community action prevented the opening of a chemical complex in Korea until appropriate pollution control equipment was installed.

When factories respond directly to communities, the results may bear little resemblance to the dictates of formal regulation. For example, Cribb also cites the case of a cement factory in Jakarta that—without admitting liability for the dust it generates—"compensates local people with an ex gratia payment of Rp. 5,000 and a tin of evaporated milk every month." In India, Anil Agarwal and colleagues (1982) describe a situation where, confronted by community complaints, a paper mill installed pollution abatement equipment—and, to compensate residents for remaining damage, the mill also constructed a Hindu temple.[3] If all else fails, community action can also trigger physical removal of the problem. In Rio de Janeiro, for example, a neighborhood association protest against a polluting tannery led managers to relocate it to the city's outskirts.[4]

3.2 The Power of the Market

The environmental concerns of market agents create additional incentives for pollution control (Figure 3.3). Green consumers are al-

Figure 3.3 Markets and Polluters



ready well known, but investors have also become important actors. A high level of pollution intensity may signal to investors that a firm's production process is inefficient. Investors also weigh potential financial losses from regulatory penalties and liability settlements. The importance of such scrutiny has grown with the rise of new stock markets and international financial instruments: Capital markets may revalue a firm in response to bad news about its environmental performance. News of good environmental performance or investment in cleaner technologies, on the other hand, can enhance a firm's expected profitability and thus its stock value.

Several studies have confirmed that U.S. and Canadian stock markets react significantly to environmental news. Table 3.1 summarizes the evidence from recent studies, which report gains from good news and losses from bad news in the range of 1 to 2 percent. Do such changes actually motivate polluters to clean up? A recent study of toxic polluters by Konar and Cohen (1997) suggests that the answer is yes: Firms that experienced the greatest negative impact on stock prices reduced emissions the most.

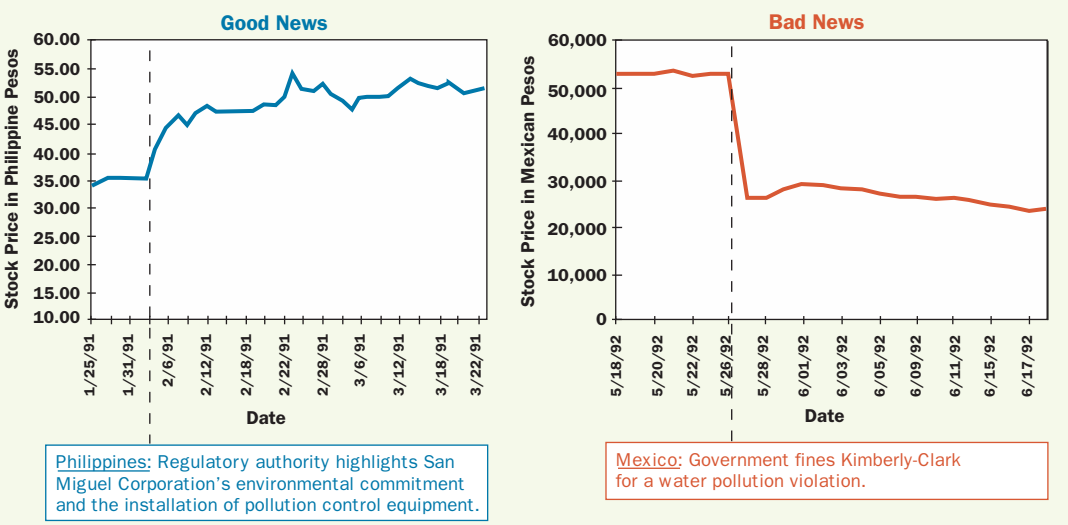
To determine whether such forces affect firms in developing countries, World Bank researchers recently undertook a large-scale study of the impact of environmental news on stock prices in Argentina, Chile, Mexico, and Philippines. None of the four countries has a strong record of enforcing environmental regulations. Nevertheless, the study found that stock prices rise when authorities publicize good environmental performance and fall in response to public-

Table 3.1 Environmental News and Stock Values in Canada and the United States

Negative Performance Information	Impact on Stock Value
• Muoghalu et al. (1990)	Average loss of 1.2% (33.3 M $)
• Lanoie, Laplante (1994)	Average loss of 1.6% to 2%
• Klassen, McLaughlin (1996)	Average loss of 1.5% (390 M $)
• Hamilton (1995)	Average loss of 0.3% (4.1 M $)
• Lanoie, Laplante and Roy (1997)	Average loss of 2%
Positive Performance Information	
• Klassen, McLaughlin (1996)	Average increase of 0.82% (80 M $)

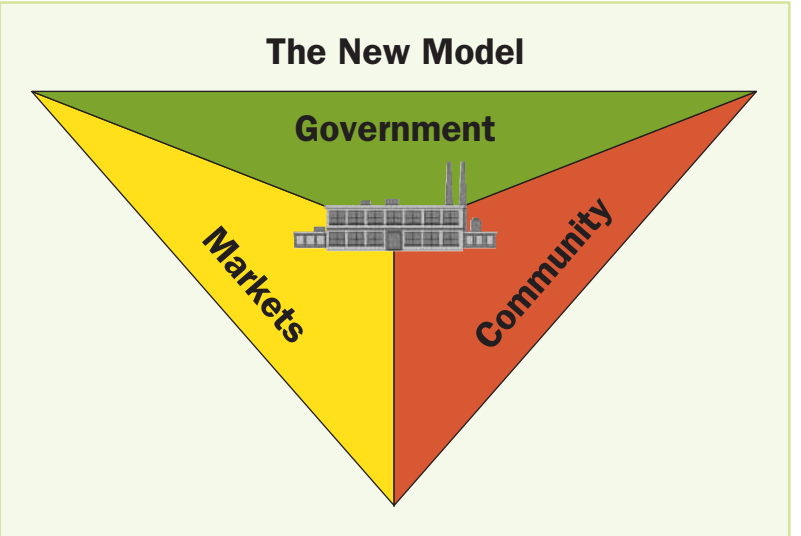
ity surrounding citizens' complaints.[5] In fact, the responses are much larger than those reported for U.S. and Canadian firms in Table 3.1: Gains average 20 percent in response to good news, and losses range from 4 to 15 percent in the wake of bad news. Figure 3.4 provides a striking illustration of such impacts for two firms operating in Philippines and Mexico. Overall, the message is clear: Capital markets

Figure 3.4 Environmental News and Stock Values in Philippines and Mexico



Source: Dasgupta, Laplante, and Mamingi (1997)

Figure 3.5 A Broader View of Regulation



everywhere are taking information about environmental performance into account, and firms are responding by cleaning up.

Another powerful market influence has been exerted by the International Standards Organization through publication of ISO 14001, its most recent business performance standard. For the first time, this ISO standard includes explicit norms for environmental management. Hundreds of developing-country firms have already made the changes necessary to qualify for ISO 14001 certification. In Mexico, a recent study shows that even small enterprises seek ISO 14001 certification if they are interested in subcontracting relationships with large, ISO-certified enterprises (Chapter 4).

Once the roles of communities and markets are introduced, we have a much more robust model for explaining variations in polluters' behavior. Even where formal regulation is weak or absent, pressure applied through these new channels can significantly increase a plant's expected penalties for polluting. Polluters will react by reducing emissions, just as if government inspectors were enforcing regulatory standards.

This new story is captured by the regulatory triangle in Figure 3.5. Regulators still play an important part in controlling pollution, but their role is no longer confined to establishing and enforcing standards or charges. Instead, regulators gain leverage through pro-

grams designed to provide concrete information to communities and markets.

3.3 Getting PROPER in Indonesia

The story of a pioneering Indonesian program illustrates the new model in action. Starting in the 1980s, the Indonesian Government charged BAPEDAL, the national pollution control agency, with enforcing standards on discharges from industrial plants. But enforcement was weak because the regulatory budget was limited and the courts were plagued by corruption. Meanwhile industrial output was growing at over 10 percent annually. By the mid-1990s the government was becoming concerned about the risk of severe damage from pollution.

Faced with this predicament, BAPEDAL decided to initiate a program for rating and publicly disclosing the environmental performance of Indonesian factories. BAPEDAL hoped that the resulting pressure would provide a low-cost way to promote compliance with regulations, as well as create new incentives for managers to adopt cleaner technologies.

The program that ensued is called PROPER—for Program for Pollution Control, Evaluation and Rating.[6] Under PROPER, BAPEDAL rates each polluter on its environmental performance (Figure 3.6). Black denotes factories that have made no attempt to control pollution and are causing serious damage, while red denotes those that have instituted some pollution control but fall short of compliance. Factories that adhere to national standards receive a blue rating, and those whose emissions controls and production and waste-management procedures significantly exceed national standards receive a green label. World-class performers attain gold ranking.

In the pilot phase of PROPER, which began in early 1995, BAPEDAL rated water pollution from 187 plants. (The agency chose to concentrate on water pollution first because it had data and experience in that domain.) The pilot group included medium- and large-scale polluters from several river basins on the islands of Sumatra, Java, and Kalimantan. Initial ratings showed that two-thirds of the plants failed to comply with Indonesian regulations (Figure 3.7).

Although this showing was dismal by Western standards, fully one-third of the rated factories were in compliance despite BAPEDAL's evident inability to enforce regulations. The PT Indah Kiat saga suggests why: Two-thirds of the regulatory triangle—local communities

Figure 3.6 Rating Polluters in Indonesia

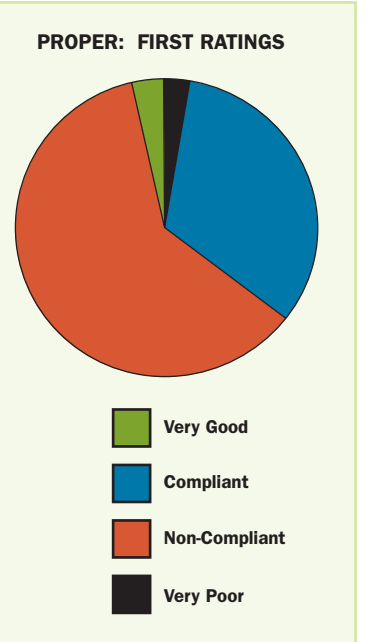
PERFORMANCE LEVELS	PROPER Ratings
GOLD	• Clean technology, waste minimization, pollution prevention
GREEN	• Above standards & good maintenance, housekeeping
BLUE	• Efforts meet minimum standards
RED	• Efforts don't meet standards
BLACK	• No pollution control effort, • Serious environmental damage

and markets—were already in place, albeit operating with poor information. These actors had already brought considerable pressure to bear.

Public disclosure is a political act and a media event, so BAPEDAL's leaders thought carefully about strategy before releasing the results. In June 1995, Indonesia's Vice President Tri Sutrisno presided over a high-profile public ceremony to congratulate the "good guys"—the five green-ranked plants whose performance exceeded formal requirements. After publicly rewarding these best actors, BAPEDAL privately notified other plants of their ratings, and gave the non-compliant ones six months to clean up before full public disclosure.

A scramble ensued as plants with red and black ratings considered their options, and by December striking changes had already occurred (Table 3.2, Figure 3.8). The most pronounced was a flight from the black group, which contracted by 50 percent. Red plants, on the other hand, felt less immediate pressure—only 6 percent im-

Figure 3.7 Before PROPER



Source: BAPEDAL

Table 3.2 PROPER's First Impact, 1995

	June	December	Change	% Change
Gold	0	0	0	0
Green	5	4	–1	–20
Blue	61	72	11	+ 18
Red	115	108	–7	–6
Black	6	3	–3	–50

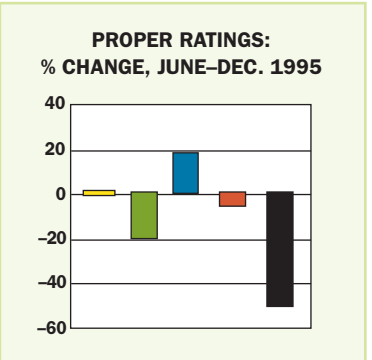
Source: BAPEDAL

proved during the predisclosure period. One green plant also changed status, but not to gold: After the June announcement, the neighboring community had informed BAPEDAL that the plant was in fact polluting heavily under cover of darkness, and the facility was demoted to black. However, four of the original six black-rated plants improved their performance. This left three plants—the newcomer plus two laggards—in the black group by December. The net effect of these changes was an 18 percent expansion of the blue, or compliant, group. Even before public disclosure, PROPER had scored a considerable success.

In December 1995, BAPEDAL delivered on its commitment to full disclosure, releasing ratings by industry group over several months to hold media attention. By December 1996—one year later—improvements had become much more pronounced (Table 3.3, Figure 3.9). Compliant plants, originally one-third of the sample, now constituted over half. While the green group was unchanged, the blue group grew by 54 percent. Red-rated plants dropped by 24 percent, and the flight from black continued. Only one plant remained in the black category—a decline of 83 percent from the original size of that group.

Evidence from mid-1997 suggests that the program's strong impact has continued. For example, BAPEDAL's December 1995 ratings included 118 noncompliant factories—113 rated red and 5 rated black[7]—but by July 1997, 38 of those plants had achieved blue or green ranking (Figure 3.10). Only 18 months after full disclosure, PROPER had reduced pollution by more than 40 percent in the pilot group. Considerable turnover was evident in the lowest category: Four plants upgraded their ratings from black to red (3) or blue (1).

Figure 3.8 PROPER's First Impact



Source: BAPEDAL

Table 3.3 PROPER's Impact After 18 Months

	June 1995	December 1996	Change	% Change
Gold	0	0	0	0
Green	5	5	0	0
Blue	61	94	33	+ 54
Red	115	87	–28	–24
Black	6	1	–5	–83

Source: BAPEDAL

Four plants rated red in 1995 fell to black in mid-1997 as their condition changed or more information became available.

With continued political support, the PROPER team hopes to rate 2,000 plants annually by the year 2000. BAPEDAL has also been pursuing its own version of Brazil's ABC targeting strategy, so the share of total water pollution under PROPER's purview is much greater than the proportion of Indonesia's 20,000 factories that it rates (Figure 3.11). If PROPER extends to 2,000 factories within the next two years, it will cover about 10 percent of Indonesia's medium and large industrial plants but about 90 percent of total water pollution. As plant coverage expands, BAPEDAL intends to rate factories on air pollutants and toxic waste as well.

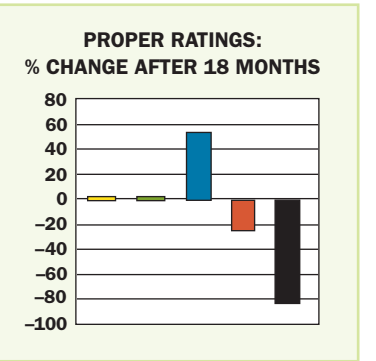
3.4 Evaluating PROPER

Given Indonesia's previous regulatory history, this remarkable result suggests that performance ratings and public disclosure can be powerful tools for improving environmental conditions in developing countries. Several factors have contributed to PROPER's success.

Public Disclosure and Pollution Control

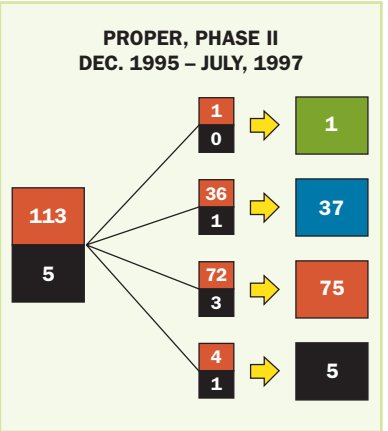
Armed with PROPER-type performance ratings, citizens are in a much stronger position to negotiate pollution control agreements with neighboring factories. This is especially true because lack of information can distort communities' perceptions. For example, residents can often see or smell organic water pollution and sulfur oxide air pollution, but emissions of metals and toxins that accumulate in organisms' tissues are likely to escape notice. And even where pol-

Figure 3.9 Results of Disclosure



Source: BAPEDAL

Figure 3.10 Extended Impact



Source: BAPEDAL

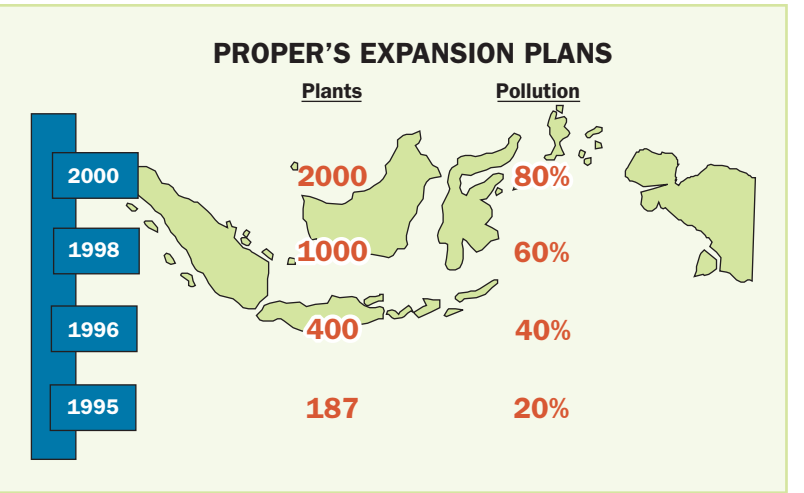
lutants are clearly detectable, local communities may be unable to gauge the severity of their long-term impact or identify individual polluters. The PROPER system adds critical information to this picture and certifies the claims of local communities, which can use PROPER's ratings to engage the most serious polluters. PROPER also allows each community to more readily choose its own level of environmental quality.

Better information can also influence the market side of the triangle in Figure 3.5. Indonesia has a new stock market and, until the recent crisis, its rapidly expanding industrial economy has had extensive credit needs. With BAPEDAL's ratings, the stock market can more accurately value companies' environmental performance, and banks can factor pollution-related liability into their lending decisions.

For consumers, nothing less than a green or gold ranking may suffice, and the availability of information through outlets such as the Internet—which PROPER has used—may greatly influence their decisions.[8] All these factors should encourage polluters to clean up.

BAPEDAL itself benefits from public disclosure. More widespread adherence to environmental standards has boosted BAPEDAL's credibility with industry, NGOs, and the public and enhanced its ability to do its job. All regulators need good data about firms' pollution, but noncompliant firms have a clear incentive to withhold such information. Under PROPER, clean firms have an incentive to identify them-

Figure 3.11 PROPER's Expansion: "2000 by 2000"



selves, and the agency can then home in on serious polluters and keep them in the public spotlight. Rewarding good performers also insulates regulators from charges that they are anti-business.

PROPER appealed to BAPEDAL because it had neither the resources nor the legal support to implement a traditional standards-based system. The agency's managers also decided that they lacked the capacity to enforce pollution charges. Viewing charge-based regulation as an inside transaction between the agency and a plant, they feared that corruption of their inspectors would distort emissions information and undermine the market-based approach. Public disclosure, by contrast, allows communities to check an agency's claims against their own daily experience.

PROPER bases its rankings on Indonesia's legal emissions standards, but disclosure systems could also use other benchmarks, such as the average intensity of emissions in each industrial sector or international performance standards. In fact, public disclosure does not have to rely on benchmarks at all—regulators could simply report each plant's emissions. The OECD's Pollutant Release and Transfer Register and the U.S. Toxics Release Inventory (Box 3.1) are examples of such disclosure programs.

However, in the developing world PROPER-type systems seem to be taking hold more rapidly. Their strength probably lies in two characteristics: They are compatible with standards-based regulations that are still on the books almost everywhere, and they rate environmental performance in a clear, straightforward format that is easy for the media to report and citizens to understand.

In principle, each locale could establish its own performance benchmarks to ensure maximum flexibility and efficiency. A sparsely populated area with few critical ecosystems, for example, could use laxer standards than a densely populated industrial area upstream from a marine sanctuary. A plant rated green in one area might well rate red in another. But neither the media nor political actors seem comfortable with such variations, and national and international market players and NGOs would find multiple-benchmark systems confusing.

Still, as we have seen, uniform performance standards can raise pollution control costs. To accommodate regional differences and enhance the efficiency of PROPER-type systems, national performance benchmarks might include three plant sizes, three levels of local environmental quality (heavy, medium, and light pollution), and vary according to industry sector.

Box 3.1 The U.S. Toxics Release Inventory

The U.S. Toxics Release Inventory (TRI) has annually reported polluters' emissions of more than 350 toxic chemicals for a decade. Since Congress established the program in 1986, TRI has published the names, locations, and toxic emissions—by chemical and medium of release—of plants with 10 or more employees that use at least 10,000 pounds of any listed chemical. The media and environmental groups provide extensive coverage of the yearly announcements. As the accompanying table shows, U.S. toxic emissions have declined substantially since TRI's beginning.

Programs like TRI use information differently from programs like PROPER. In the Indonesian case, a poor rating informs the public that a firm is not in compliance with national environmental standards. Disclosure programs such as TRI, by contrast, disseminate "raw" information on toxic emissions with no interpretation or risk assessment.

One problem is that some chemicals covered by TRI are quite dangerous, even in small doses, while others are hazardous only after long exposure at very high levels. By treating all chemicals the same, raw disclosure programs may sometimes alarm the public unnecessarily and pressure industry into adopting high-cost abatement programs that yield few social benefits. Academic researchers and NGOs have used media such as the Internet to inform the public of the relative risks of different chemicals, and to assist communities in identifying large polluters and assessing their overall pollution problems. (The Environmental Defense Fund maintains the most complete such Web site at *http://www.scorecard.org.*)

Community pressure is only one of several channels through which TRI exerts its effects; the financial community has also responded strongly. Research by Hamilton (1995) and Konar and Cohen (1997) has shown significant negative market returns for publicly traded firms when TRI first reports their pollution. Firms' market valuation also responds to information about changes in the volume of toxic pollution relative to toxic emissions from other firms. These results, in turn, create significant incentives to clean up: Firms with the largest stock market declines reduce emissions more than other firms. Numerous case studies have also shown that TRI induces firms to improve their ability to manage materials and waste.

Total Releases of TRI Chemicals 1988–1994 ('000 Metric Tons)

	1988	1992	1993	1994	% Change 1988–1994
Total Air Emissions	1024	709	630	610	–40
Emissions to Surface Water	80	89	92	21	–73
Underground Injection	285	167	134	139	–51
On-Site Land Releases	218	149	125	128	–41
Total Releases	1607	1113	981	899	–44

These successes have inspired similar efforts in other countries, including the Chemical Release Inventory in the United Kingdom and OECD sponsorship of pilot Pollutant Release and Transfer Registers (PRTRs) in Egypt, the Czech Republic, and Mexico. The PRTR programs use the same format as TRI but restrict listed chemicals to those with relatively high hazard ratings.

The Costs of PROPER

PROPER's direct costs should include only those entailed in developing the ratings from existing information on emissions and disseminating the results. However, during the program's first 18 months, BAPEDAL devoted most of the program's resources to upgrading the agency's ability to collect and analyze data—efforts necessary for any effective pollution control program. The pilot program also employed foreign consultants, although PROPER has since operated with much lower levels of foreign involvement.

Despite these added expenses, PROPER's costs were only about $100,000 over the first 18 months. With 187 plants rated, the per-plant cost was $535, or $360 per year—just $1 per day. Given that this expenditure produced a 40 percent cut in organic water pollution, PROPER must be judged spectacularly cost-effective.

Of course, the acid test for the program comes after the international consultants have gone home and local industry realizes that life under PROPER will mean permanently increased pressure for pollution control. In Indonesia, the difficulties that normally accompany a program's adolescence have been compounded by the nation's severe economic crisis, which has produced dramatic cuts in BAPEDAL's budget. But paradoxically, the crisis seems to have strengthened PROPER's appeal. As resources for traditional monitoring and enforcement have diminished, Indonesia's leaders have found PROPER's low-cost leveraging of community and market action even more attractive.

Overall, PROPER-type programs are efficient because they leverage channels inaccessible to formal regulation. However, a recent study found that PROPER had a disproportionate impact on small factories, whose marginal abatement costs are typically high (Box 3.2). PROPER's effects also varied according to plant ownership: Reputation-sensitive multinationals responded most strongly, followed by private domestic firms, and then state enterprises. In short, PROPER induced factories of all types to cut pollution, but it shifted the relative burden to smaller plants and multinationals. The latter were relatively well positioned to bear this burden but the former probably were not. In the next chapter we will show how targeted efforts by government can help small factories overcome this disadvantage.

Implementing PROPER-Type Programs Outside Indonesia

When PROPER's impact first became apparent, other countries tempered their interest with a critical question: Since shame may be

Box 3.2 Changes in Compliance Patterns Under PROPER

Figure 3.7 summarizes initial compliance levels for the 187 factories in the pilot group for PROPER. A preliminary BAPEDAL/World Bank analysis of the program's impact has studied the effects of plant size, ownership (public, local, multinational), degree of export orientation, province, and industrial sector on compliance.

When PROPER began, plant size and public ownership had significant, positive associations with compliance; sectoral variations were also important, but multinational ownership had no effect. After 18 months, compliance patterns were very different. Plant size, public ownership, and sectoral variation had become insignificant as determinants of relative compliance. However, multinational ownership jumped to a very high level of positive significance while export orientation moved the other way—toward negative significance.

We interpret these results as follows. **Plant size**: Before PROPER, many big plants with low abatement costs had already reduced emissions because they faced significant expected pollution penalties from community and market action. Since smaller plants with higher abatement costs had not reduced pollution much in the "old regime," they found themselves in the spotlight once PROPER began. The resulting pressure forced them toward parity in compliance with big plants. **Ownership**: When PROPER began, publicly owned plants in Indonesia were more compliant than average. This was unusual by international standards, since research on other countries has shown that such plants are normally heavy polluters (Chapter 5). However, after 18 months, the compliance status of publicly owned plants was not significantly different from the status of other domestically owned factories. The converse was true for multinational plants. Having started at parity in compliance with their domestic counterparts, they jumped to significantly higher compliance status. These results suggest highly varied sensitivity to environmental reputation: Multinationals are the most sensitive, followed by domestic private firms, and then state enterprises. PROPER increased pollution control in all three types of plants, but the strength of the response differed sharply. This result is consistent with the idea that public disclosure leverages pollution control through the operation of markets in which environmental performance is valued.

Finally, and paradoxically, the response to PROPER seems to have been perverse among more export-oriented plants. These factories responded more slowly than domestically oriented plants, so their relative (not absolute) compliance was lower after 18 months. This result suggests that different market channels have very different sensitivity to environmental information: International stockholders may be much more sensitive to environmental performance than international importers.

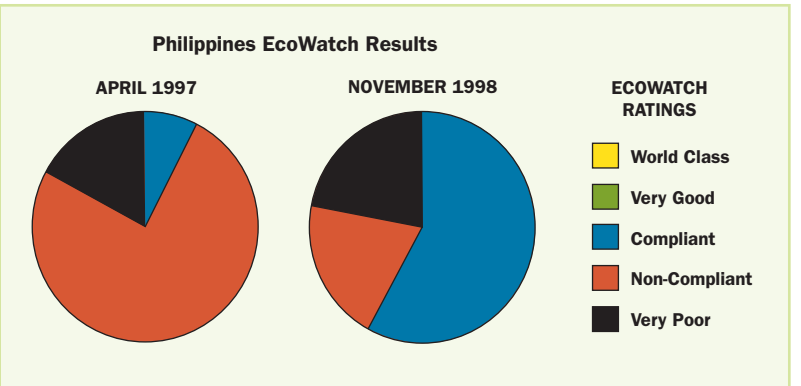
a strong motivator in a public disclosure program, does Indonesian culture make such a program particularly effective? The answer has proven to be no as other countries have begun PROPER-type programs.

The most advanced such effort is in Philippines, where the Department of Environment and Natural Resources (DENR) has created a program similar to PROPER, called EcoWatch. In April 1997 EcoWatch published its initial accounting for 52 factories in the Manila area. The summary showed that 48 plants ranked red or black, representing a 92 percent rate of non-compliance. As in Indonesia, the most compelling argument for public disclosure was the evident failure of the traditional approach (Figure 3.12).

To establish EcoWatch, the Philippine Government pursued a strategy similar to BAPEDAL's. President Fidel Ramos congratulated the blue plants in a public ceremony (there were no green or gold plants). Red and black plants were privately notified of their ratings and given a substantial period to reduce pollution. Full public disclosure occurred in November 1998, with broad media coverage. As in the Indonesian case, the program dramatically increased plants' compliance with national regulations. Although no factories reached green or gold status, blue ratings jumped from 8 percent in April 1997 to 58 percent in November 1998. Red ratings fell sharply, while black ratings remained almost constant.

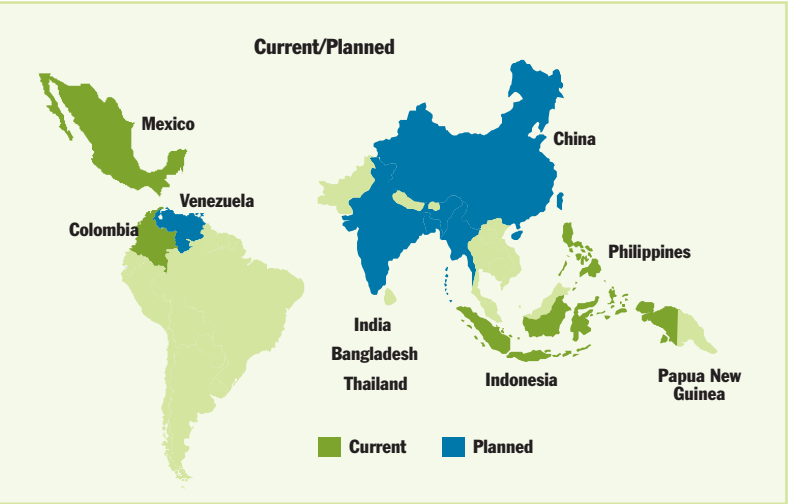
Other countries are following closely in the wake of Indonesia and Philippines. Mexico is developing a program called Public Environmental Performance Indicators, or PEPI, and Colombia's public disclosure program will complement its pollution charge system. At least five other countries have also begun pilot implementation or active consideration of PROPER-type systems (Figure 3.13). What

Figure 3.12 Public Disclosure in Philippines



Source: DENR

Figure 3.13 PROPER's Legacy



began as a ripple in Indonesia is clearly building into an international wave.

3.5 Regulating Pollution and Promoting Equity in the Information Age

Widespread acceptance of PROPER reflects a broader trend in public policy. Students of economic development are paying closer attention to the role of social capital—the informal relationships and institutions that strengthen developing communities. Similarly, legal scholars are focusing on the strong complementarity between social norms, which communities draw on to enforce public disclosure programs, and formal laws. The evidence shows that formal and informal regulatory mechanisms almost always coexist, but that the latter often dominate in developing countries where regulatory institutions are weak.[9]

In environmental policy, new thinking about the role of local influence reflects the insights of Nobel economist Ronald Coase, who called traditional regulation into question by noting that pollution victims, as well as regulators, can take action if they perceive that the benefits outweigh the costs.[10] As Coase noted, these costs stem from the need to acquire and analyze information, confront polluters, and

negotiate settlements. Without good information such settlements may be far from optimal. Polluters and regulators usually have the most concrete knowledge of emissions; but polluters are unlikely to share this information in the absence of outside pressure, and bureaucratic inertia and/or legal constraints often prevent regulators from sharing information as well. Moreover, even if the public has information on emissions, it may not fully understand the risks it faces. Since polluters are also employers, good information on abatement costs is also important.

In short, effective local negotiations require good environmental information, and regulators will often be best positioned to supply it. They can play a valuable new role by focusing more resources on information collection and dissemination, including public disclosure of polluters. But a new role for regulators does not mean that they should abandon the traditional one. Efficient enforcement of regulations will remain very important—for its own sake, and because potential penalties provide an incentive for capital markets to react to public disclosure of non-compliance. In addition, as in the case of PT Indah Kiat in Sumatra, regulators can encourage local settlements by promoting negotiations, supplying the negotiators with objective information, and, as a last resort, posing the threat of official sanctions against non-compliant factories that refuse to negotiate with pollution victims.

Regulators can also serve the special environmental protection needs of poor communities. In countries as different as the United States, China, Brazil, and Indonesia, much of the variation in factories' environmental performance reflects the socioeconomic characteristics of the surrounding areas.[11] Local residents pressure polluters more successfully if they are richer, more educated, and better able to bargain because they have more employment options. In developed countries, the so-called NIMBY (not in my back yard) phenomenon stems largely from wealthy communities' ability to exclude polluting activities completely. Employment concerns may lead poor communities to welcome industrial activity, but such communities may lack enough political influence and environmental information to negotiate effective pollution control agreements. Economic development may be the best antidote to such problems in the long run, but in the meantime poor communities may suffer from excessive pollution.[12] Here environmental agencies can help, by educating communities on the pollution risks they face and ensuring that polluters conform to basic national norms. We will return to this issue in Chapter 4.

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End Notes

1. For a detailed account, see Sonnenfeld (1996).

2. See Pargal and Wheeler (1996), Hettige, Huq, Pargal, and Wheeler (1996), Huq and Wheeler (1992), Hartman, Huq, and Wheeler (1997), and Dasgupta, Lucas, and Wheeler (1998).

3. Such arrangements are not confined to developing countries. Even in strictly regulated societies like the United States, communities can make life difficult for plants that violate local norms, whether or not their activities meet formal regulatory requirements. A good example is the recent controversy over proposed construction of four new electric power plants in Massachusetts' Blackstone Valley. Although the proposed plants easily exceed regulatory requirements—and indeed, they have been lauded by environmental groups—the plants have met with stiff community resistance. Local leaders have protested that three power plants already operate in the region, and that four more facilities will harm the community's quality of life, use up water, and lower property values. According to Sacha Pfeiffer (1998), writing in the *Boston Globe*, "In order to make the plants 'more palatable,' several power companies have offered compensation packages to Blackstone Valley communities, including money for high school scholarships, new water and sewer facilities and water conservation programs."

4. See Stotz (1991).

5. See Dasgupta, Laplante, and Mamingi (1997).

6. For detailed descriptions and analyses of PROPER, see Afsah, Laplante, Shaman, and Wheeler (1997), Afsah, Laplante, and Wheeler (1997), and Afsah and Vincent (1997).

7. During the predisclosure period, PROPER rated several additional plants, finding two new blacks and five new reds. Red and black plants therefore number 118 in Figure 3.10 and 111 in Table 3.2.

8. BAPEDAL's PROPER ratings can be found on the agency's Web site: *http://www.bapedal.go.id/profil/program/proper.html.*

9. For a more detailed discussion, see Tietenberg and Wheeler (1998).

10. See Coase (1960).

11. See Pargal and Wheeler (1996), Hettige, Pargal, Singh, and Wheeler (1997), Hettige, Huq, Pargal, and Wheeler (1996), Huq and Wheeler (1992), Hartman, Huq, and Wheeler (1997), and Dasgupta, Lucas, and Wheeler (1998).

12. See Dasgupta and Wheeler (1996), Wang and Wheeler (1996), and Pargal and Wheeler (1996).