

*A Case Study for the HIID 1997 Asia Environmental Economics Policy Seminar*

## **Putting Pressure on Polluters: Indonesia's PROPER Program**

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### **I. Introduction**

Indonesia is one of Asia's "miracle economies." A poor, primarily agricultural country two decades ago, it is emerging as a regional industrial powerhouse. Gross investment in equipment and structures grew at a median rate of 8 percent per year during 1985-94.<sup>2</sup> Manufacturing value-added grew even more rapidly, at 10 percent per year. Between 1980 and 1991, the nation's output of iron and steel increased more than four-fold, processed wood products more than three-fold, and a host of other industrial products, such as textiles, footwear, paper products, glass, metal products, and transport equipment, two-fold or better.

Industrialization has created much-needed jobs in a country that is the fourth most populous in the world. It is a prime reason why the average Indonesian's real income has doubled since 1980, and the number of Indonesians living in poverty has fallen by more than half since 1970. But by the late 1980s, a less positive consequence of industrialization was becoming increasingly apparent to Indonesians living in and around industrial centers: rapidly deteriorating air and water quality. Three-fourths of industrial facilities were located on the island of Java, which is one of the most densely populated portions of the earth's surface. When Indonesia established its first air-quality monitoring station in Jakarta in 1978, airborne concentrations of suspended particulate matter already exceeded the World Health Organization's (WHO) recommended standard by 40 percent. By 1988, they were double the standard. Sulfur dioxide concentrations rose even more rapidly, doubling between 1981 and 1988. Rivers were increasingly fouled by industrial effluent. Biochemical oxygen demand (BOD) measured at water-quality monitoring stations

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<sup>2</sup> Unless indicated otherwise, all figures in the text are in real (inflation-adjusted) terms.

rose from 3-6 milligrams per liter in the early 1980s to more than 10 milligrams per liter by the early 1990s. A study by the World Bank estimated that exposure of urban residents to airborne particulate concentrations above the WHO standard caused an additional 1,263-2,352 deaths, 26,609-71,033 emergency room visits, 184,453-541,618 asthma attacks, and 5.3-11.8 million lost work days in Jakarta in 1989.<sup>3</sup>

The government scarcely monitored the environmental performance of industrial facilities in the 1980s, and its enforcement efforts were virtually nonexistent. The Ministry of Population and Environment had limited resources to regulate industrial pollution, and governors of provinces, whose principal concern was to increase employment and income by attracting investment, felt little incentive to do so. Increases in the Ministry's annual budget allocation were tiny compared the rate of industrial growth, exceeding the inflation rate by just over 1 percent. The Ministry's pollution-control activities were not simply failing to keep pace with industrialization; they were falling further and further behind.

### **The PROKASIH Program**

This situation forced the Ministry to experiment with approaches to environmental regulation other than Western-style "command and control." In 1989, the Ministry decided to focus its limited resources on a semi-voluntary program for controlling the discharge of industrial pollution in waterways. It formally announced its "Clean River Program," better known as PROKASIH, on June 19, 1989.<sup>4</sup> This program established interagency teams within individual provinces. These "PROKASIH teams" included representatives from a range of agencies, including the regional development planning board (BAPPEDA), the public works department, the health department, environmental study centers, and environmental laboratories. They were responsible for several activities, including:

- (i) selecting specific rivers or portions of rivers where concerns over water quality were the greatest,
- (ii) identifying the industrial facilities that were the most significant polluters,
- (iii) drawing up pollution-reduction agreements to be signed by provincial Vice-Governors and polluting facilities, and
- (iv) collecting data on pollution concentrations in facilities' effluent and in receiving waters and reporting those data to the Ministry.

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<sup>3</sup> Bart Ostro, "Estimating the health and economic effects of particulate matter in Jakarta: a preliminary assessment" (paper presented at the Fourth Annual Meeting of the International Society for Environmental Epidemiology, held August 26-29, 1992, in Cuernavaca, Mexico).

<sup>4</sup> Our primary source of information on PROKASIH is: Shakeb Afsah, Benoît Laplante, and Nabil Makarim, "Program-based pollution control management: the Indonesian PROKASIH program" (Policy Research Working Paper No. 1602, The World Bank, Washington, D.C., December 1995; web-site address: [www.nipr.org/work\\_paper/1602/index.htm](http://www.nipr.org/work_paper/1602/index.htm)).

From 1990 onwards, the new Environmental Impact Management Agency, or BAPEDAL, administered the program. BAPEDAL reported directly to the President's office. It co-signed the pollution-reduction agreements, jointly financed the program with provincial governments, and reviewed the data collected by the PROKASIH teams.

Eight provinces agreed to participate in the program initially. Participation by polluters was not voluntary: facilities selected by the PROKASIH teams were obliged to negotiate and sign the pollution-reduction agreements. These agreements were not legally binding, however, and their details were not made public. In this sense, the program was voluntary: facilities could determine the degree of compliance with the terms of the agreements, without suffering any regulatory consequences if they simply ignored them.

At the inception of PROKASIH, BAPEDAL could not point to any evidence that similar programs had worked in neighboring countries, as none had tried such programs. Yet, BAPEDAL's lack of funds and manpower made the agency willing to gamble that PROKASIH would at least make polluters aware that they were polluting, the first step toward getting them to change their behavior. In some respects, PROKASIH was similar to the U.S. Environmental Protection Agency's 33/50 Program, a voluntary program aimed at reducing the release of toxic chemicals. But the U.S. agency had introduced this program only a couple of years before PROKASIH, and its success did not become clear until the early 1990s.

To BAPEDAL's pleasant surprise, PROKASIH induced several polluters to leap, not step, toward improved environmental performance. A World Bank study of 34 river basins included in the program found that the aggregate BOD load discharged by participating facilities fell in 24 river basins by 1994.<sup>5</sup> The median reduction in BOD load in the 24 river basins was 59 percent. BOD pollution fell in relative terms as well: the BOD discharge per unit of output fell by about 55 percent. Rising pollution control effort, not falling output, was thus the driving force behind the reduction in aggregate BOD load. Encouraged by the program's success, BAPEDAL expanded it to 13 provinces by 1994, with the number of industrial facilities included in it rising by a factor of more than three.

Perhaps the most important thing BAPEDAL learned from PROKASIH was that pollution discharge varied tremendously across facilities. Many officers on BAPEDAL's staff were environmental engineers, used to thinking of pollution control in terms of end-of-pipe technologies. If facilities had the "right" technologies, and actually used them, then pollution would be negligible; if they didn't, then pollution would be proportional to output. Given the history of weak enforcement in the country, there was no reason to expect that facilities had invested in pollution control. Even if they had, there was no reason to expect that they were actually running the equipment. In either case, there was no reason to expect pollution discharge to vary much across facilities: it would be extreme in all cases.

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<sup>5</sup> *Ibid.*

But this is not what BAPEDAL found when it examined the baseline data on pollution discharge collected by the PROKASIH teams at the start of the program. Instead, it found that a small number of extreme polluters were discharging most of the BOD load, and that most facilities were discharging relatively small amounts. A later, more rigorous analysis by the World Bank confirmed BAPEDAL's findings: in 1990, when PROKASIH was being launched, just 10 percent of the facilities were discharging 50 percent of the BOD load, and just 20 percent were discharging 75 percent.<sup>6</sup> In contrast, the 50 percent "cleanest" facilities were discharging less than 5 percent of the BOD load.

This skewed distribution confirmed the wisdom of targeting regulatory efforts, but it raised a question without an immediately obvious answer: why did pollution discharge vary so much, when all facilities were facing the same (weak) regulatory environment? BAPEDAL's hunch, confirmed subsequently by a World Bank study,<sup>7</sup> was that the conventional regulatory approach, which assumed that the only relevant parties in the regulatory process were industrial polluters and government regulators, ignored two other key parties: the communities in which industrial facilities are located, and the markets in which they purchase their inputs and sell their products. This observation was the starting point for the development of BAPEDAL's Program for Pollution Control, Evaluation, and Rating, better known as PROPER, which is based on public disclosure of facilities' environmental performance.<sup>8</sup>

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## II. Development and Design of PROPER

Although the Indonesian parliament approved the country's framework Environmental Law in 1982, promulgation of regulations under it proceeded slowly until the 1990s. Few regulations were in place when PROKASIH was launched. In fact, Government Regulation Number 20 of the Year 1990, "Concerning the Control of Water Pollution," was issued by presidential decree nearly simultaneously with the presidential decree that created BAPEDAL. A 1991 ministerial decree (KEP/MEN/03/1991) specified effluent discharge standards for 14 industries and more general standards, linked to water quality objectives in the receiving rivers, for remaining industries. This decree also authorized BAPEDAL to enforce the standards under a program dubbed JAGATIRTA. Regulations for other environmental media and for compre-

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<sup>6</sup> *Ibid.*

<sup>7</sup> Sheoli Pargal and David Wheeler, "Informal regulation of industrial pollution in developing countries: evidence from Indonesia." (Policy Research Working Paper No. 1416, The World Bank, Washington, D.C., February 1995; web-site address: [www.nipr.org/work\\_paper/1416/index.htm](http://www.nipr.org/work_paper/1416/index.htm)).

<sup>8</sup> Our principal source of information on PROPER is: PROPER-PROKASIH Team (BAPEDAL) and PRDEI (World Bank), "What is PROPER? Reputational incentives for pollution control in Indonesia" (web-site address: [www.nipr.org/work\\_paper/propwhat/index.htm](http://www.nipr.org/work_paper/propwhat/index.htm)). For a more concise account, see David Wheeler and Shakeb Afsah, "Going public on polluters in Indonesia: BAPEDAL's PROPER PROKASIH Program" (*East Asian Executive Reports*, May 1996; web-site address: [www.nipr.org/work\\_paper/proper/index.htm](http://www.nipr.org/work_paper/proper/index.htm)).

hensive environmental assessment followed. Government Regulation Number 51 of the Year 1993, “Regarding Environmental Impact Assessment (AMDAL),” came two years later, and Government Regulation Number 19 of the Year 1994, “Regarding Hazardous and Toxic Waste Management,” came three years later. Both were presidential decrees. A 1995 ministerial decree specified air emissions standards for stationary sources.

Environmental agencies around the world have traditionally treated regulatory compliance as an “either/or” proposition: to be in compliance, facilities must satisfy all provisions of the pertinent regulations. There is no middle ground. Facilities cannot be, say, 50 percent in compliance. They either comply, in which case environmental regulators take no punitive action; or they don’t, in which case regulators levy fines or other penalties (e.g., suspension of operating licenses). This approach struck Mr. Nabel Makarim, Deputy for Pollution Control at BAPEDAL, as unnecessarily limited in scope and degree. It was limited in scope in that regulators always punished and never rewarded. This made the relationship between regulators and industry purely negative: regulators existed to find industry’s mistakes and punish it for them. Regulators did not reward superior performance. Polluters, which all facilities inevitably are to a greater or lesser degree, had no incentive to identify themselves to regulators, even if they were reasonably good performers, as the attention of regulators could bring only costs and no benefits.

The traditional approach was limited in degree in that it ignored the range in actual environmental performance that BAPEDAL was finding characterized facilities in the PROKASIH program. The traditional approach grouped facilities that were violating only a few (perhaps only one) of the provisions in environmental regulations, and thus might be among the 50 percent of facilities responsible for only 5 percent of the pollution, into the same noncompliance category as facilities that were flagrantly violating the regulations and discharging the great bulk of pollution. Having just two categories, in-compliance and out-of-compliance, gave a distorted picture of the industrial pollution problem and an environmental agency’s progress toward addressing it.

As an alternative, in December 1993 Makarim proposed a color-coded rating system for “grading” facilities’ performance. He proposed subdividing the in-compliance category into blue, green, and gold ratings, and the out-of-compliance category into red and black ratings. A blue rating indicated that a facility just satisfied all the provisions in applicable environmental regulations. A green rating indicated that its performance was substantially better than the regulations required, and a gold rating, which Makarim thought should be awarded rarely, indicated that its performance was exceptionally good. Similarly, a red rating indicated that a facility was applying some environmental management effort but not enough to satisfy all the provisions, while a black rating was reserved for the worst performers, who were making no effort to control their pollution discharge. Makarim chose these colors because they had cultural connotations in Indonesia analogous to the environmental performance levels they signified.



The idea of a color rating system probably would not have attracted much attention among senior policymakers had Makarim not gone on to propose that BAPEDAL make the ratings public. In his view, the value of the system came less from improving the relationship and flow of information between BAPEDAL and industry, although these were important, than from the provision of information to communities and markets that interacted with the facilities. That is, he thought the ratings could influence the facilities' reputations, and thereby use honor and shame to create reputational incentives for better environmental performance. From experience with PROKASIH, he and others at BAPEDAL suspected that variations in environmental performance reflected a combination of community pressure, at least when the media, local governments, NGOs, and other community organizations (e.g., religious groups) could attribute pollution problems to specific facilities, and market pressure, when companies thought they could obtain a market advantage from good environmental performance.

Public disclosure of ratings would help expose polluters to these reputational pressures. It would also help direct those pressures to the right problems: the most harmful pollutants are not always the most obvious ones (heavy metals, toxic chemicals), and conversely the most obvious ones are sometimes relatively innocuous (certain organic wastes). Moreover, identifying the worst pollution sources is often not easy when, for example, several facilities are located in the same industrial estate. By helping communities identify the main sources of the most damaging pollutants, the rating system would help them apply pressure where it really counted.

Public disclosure of ratings was consistent with a prominent but rarely used principle in the 1982 Environmental Law: community participation in environmental management. What had not been anticipated in 1982, however, and therefore was not mentioned in the law, was that markets might also offer incentives for companies to improve their environmental performance. Although the domestic "green consumer" movement was small and largely limited to the well-educated, suburban elite in Jakarta and other cities, Indonesian companies in some sectors, notably wood products, were facing increasing pressure from consumers, environmental groups, and in some cases legislators in export markets. The Earth Summit raised the profile of "green" consumerism and the domestic and international NGOs that championed it, as did discussions over domestic environmental practices during the Uruguay Round of the GATT negotiations. At least one Indonesian coal mining company, P.T. Adaro, had started aggressively marketing its "Envirocoal," which was unusually low in sulfur and ash content, to Western utilities facing strict environmental regulations. Makarim reasoned that companies in other sectors might also respond to the market opportunities generated by "green" consumerism, and clean up their acts in the process, if a credible source verified their superlative environmental performance in a clear, easy-to-understand fashion.

Makarim succeeded in convincing Sarwono Kusumaatmadja, State Minister of Environment, to proceed with a pilot color rating scheme, with a proposed

launch date of June 1994. But BAPEDAL faced several challenges in turning Makarim's color rating system into an implementable program, and these challenges forced it to postpone the launch until June 1995.

### **From Regulations to Colors**

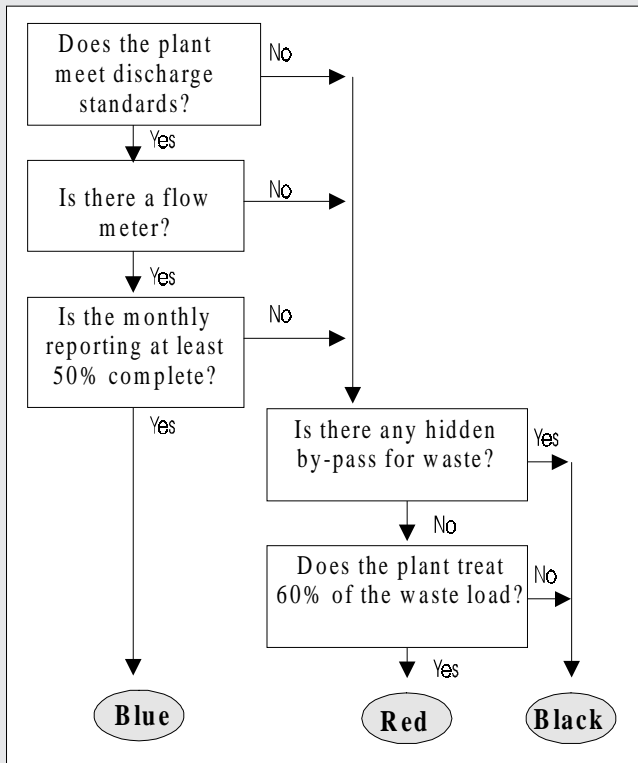
The first major challenge was to translate the country's complex set of environmental regulations into the five color codes. By the early 1990s, Indonesia had in place numerous newly adopted environmental regulations. Discharge standards necessarily varied by pollutant, and, as in the case of standards in the water regulations, they sometimes also varied across industries and locations. One option was to give a color rating for every individual standard and provision in the regulations, but that would have destroyed the ability of the system to communicate a facility's overall "grade." Given BAPEDAL's relative depth of experience with water pollution, first through PROKASIH and then through JAGATIRTA, it decided to simplify the task by focusing initially on water pollution. Even then there was a complication, however, as Indonesia had provincial water pollution regulations in addition to national ones. In some cases, the provincial regulations differed significantly from their national counterparts. To build public understanding and promote the rating system as a national program, BAPEDAL decided to use only national water pollution regulations (i.e., KEP/MEN/03/1991) in defining the initial ratings.

In early 1994, BAPEDAL mobilized a technical team of environmental experts from Australia, Canada, and the World Bank, as well as its own staff, to translate the regulations into color ratings and design a program for putting the ratings into practice. Initial efforts, which included an extensive survey to collect factory-level data, produced an elaborate system that seemed inappropriate given BAPEDAL's limited resources and the limited amount and quality of regularly available data. The proposed system was dropped, and expatriate members of the technical team returned to their respective countries.

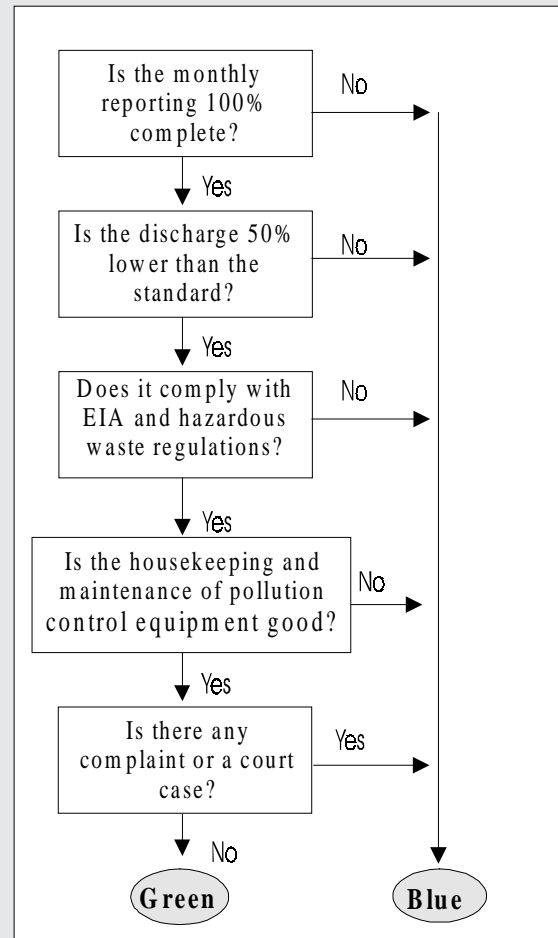
Undaunted, a group of BAPEDAL staff members continued to collect data and refine the methodology. From February 1995 onwards, BAPEDAL began a concerted effort to launch the program, with a core team now consisting of seven of its own staff and an advisor from the World Bank. This group succeeded in designing a short series of yes/no questions that covered key provisions of the regulations and made it easy to determine which color rating a specific facility deserved. Figures 1-3 show these questions and the mapping from regulations to the five colors. Most of the questions relate either to the size of the pollution load relative to the effluent discharge standards specified in KEP/MEN/03/1991, or to self-monitoring provisions related to the installation of an effluent flow meter, daily measurement of the flow rate, and monthly sampling and analysis of the effluent.

The mapping from regulations to colors was a conservative one: a polluter had to comply with all provisions in the regulations to receive a blue or higher rating. Good or excellent performance according to several provisions was not allowed to compensate for inadequate performance according to even one. BAPEDAL's worries that NGOs and their constituencies might be skeptical

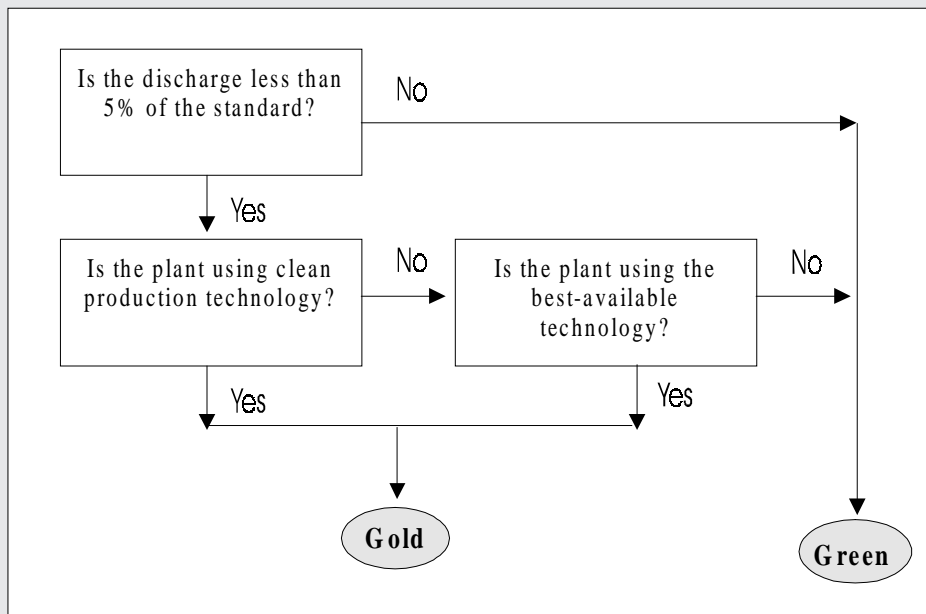
**Figure 1**  
**Criteria for Blue vs. Red vs. Black Ratings**



**Figure 2**  
**Criteria for Blue vs. Green Ratings**



**Figure 3**  
**Criteria for Green vs. Gold Ratings**





of environmental performance ratings from a government with an obvious commitment to rapid industrial development prompted this conservative approach.

### **Minimizing the Risk of Ratings Errors**

BAPEDAL also worried about mistakes being exposed after the ratings had been made public. This would not have been a problem if the ratings were not publicly disclosed, as BAPEDAL could in that case simply notify the industrial facility of the error. But mistakes made in public could destroy the credibility of the rating system, particularly if they occurred early on. NGOs would be sure to question BAPEDAL's objectivity if they found it had assigned blue, green, or gold ratings to egregious polluters, and industry organizations would question its competence if good performers were given red or black ratings.

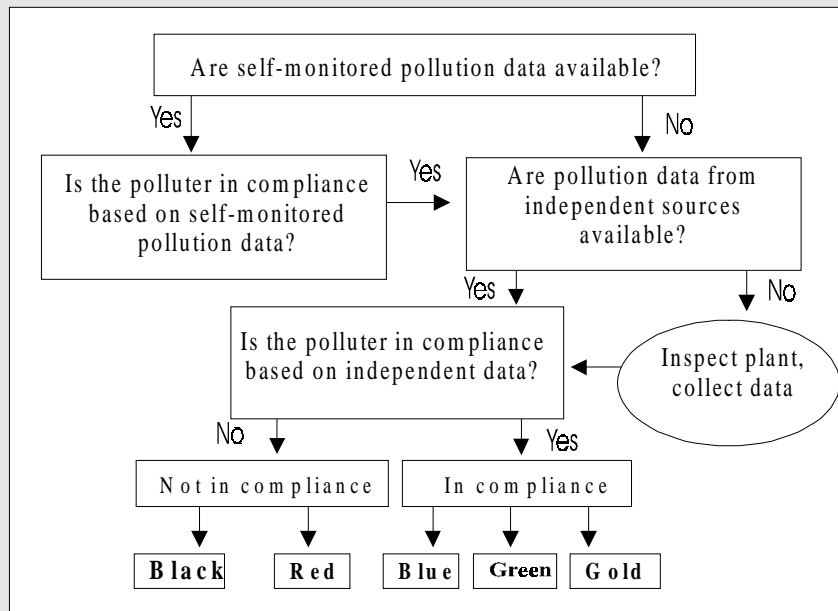
The simplicity of the criteria for assigning colors reduced, but did not eliminate, the risk of error. The principal remaining risk came from inaccurate and incomplete data. And this had BAPEDAL worried. Privately, it doubted the accuracy of the pollution data reported by some of the PROKASIH teams. These doubts were justified: the World Bank, in its analysis of PROKASIH's performance, used data for only 155 of the 778 industrial facilities that participated in the program in 1990 and 1991, as it judged data for the remaining facilities to be unreliable or incomplete.<sup>9</sup>

BAPEDAL responded to this problem by basing the rating system upon multiple sources of data, including independent inspections; by developing a user-friendly computer program for analyzing the data; and by designing a multi-step process for reviewing proposed ratings before making them public. BAPEDAL had up to four separate sources of pollution data on individual facilities. First, it had been compiling data from the provincial PROKASIH teams since 1989. Second, its inspectors had been collecting data for JAGATIRTA since 1991. JAGATIRTA covered some of the same facilities as PROKASIH, generally ones whose neighbors had filed complaints with BAPEDAL. Third, BAPEDAL sent out a mail survey to prospective participants in the rating system in February 1995, and it conducted special inspections of some facilities to collect additional information. Finally, BAPEDAL required all facilities participating in the system to monitor themselves and to report their pollution discharge on a monthly basis. Among these four data sources, BAPEDAL considered data from its own inspectors, whether from JAGATIRTA or from special visits, to be the most reliable.

BAPEDAL designed a data protocol that precluded ratings being based solely on data reported by the facilities. As Figure 4 shows, self-monitored data that indicated a facility was in compliance had to be confirmed by data from an independent source. If reliable independent data were not already available from PROKASIH or JAGATIRTA, BAPEDAL would send in its inspectors.

<sup>9</sup> Afsah, Laplante, and Makarim, *op. cit.*

**Figure 4**  
**Data Verification**



BAPEDAL designed the computer program to minimize human error in the handling and analysis of data and to aid in data verification. Based on data entered by the computer operator, the program performed necessary calculations and helped determine the facilities' provisional ratings. The design of the rating criteria as yes/no questions made this task well-suited for a user-friendly computer program. The program compared data and results from all available sources, thus identifying discrepancies and helping BAPEDAL conduct targeted investigations to resolve them. In the event of a controversy over a rating decision, the simplicity and transparency of the program would make it easy for BAPEDAL to explain how it arrived at its decision.

Because gold, green, and black ratings were considered extraordinary—exceptionally good or bad—BAPEDAL included a “final filter” of intensive discussions about facilities provisionally assigned those ratings. In these discussions, staff from all divisions of BAPEDAL scrutinized ambiguities and drew upon additional information to improve the accuracy of the rating decisions. BAPEDAL also included a three-step review process for the ratings: it decided to disclose the ratings only after they had been approved by: (i) a special advisory board, which included members from outside BAPEDAL (for example, the Department of Health, business associations, and NGOs); (ii) the State Minister of Environment; and (iii) the President. Figure 5 summarizes the steps in the rating process.

To ensure that press reports on the rating system were accurate, BAPEDAL even arranged for officers involved in the project to visit the offices of major local newspapers and explain the system and demonstrate the computer program.

### Selecting Facilities to be Rated

The third major challenge was to select facilities to be included in the rating system. The focus on water regulations limited the pool of potential facilities somewhat, but there were still tens of thousands of facilities discharging effluent into the country's rivers and streams. Not surprisingly, given the advantages of having as much data as possible, BAPEDAL selected most of the initial facilities from ones already participating in PROKASIH. It sent the February 1995 questionnaire to 350 facilities participating in PROKASIH. These facilities spanned the 14 industries for which KEP/MEN/03/1991 specified discharge standards. Of the facilities surveyed, BAPEDAL judged that 176, or almost exactly half, had sufficient data to be rated.

BAPEDAL also invited facilities not included in PROKASIH to volunteer to be rated. Eleven facilities did so. Hence, the initial number of participants in the rating system was 187.

### Avoiding Political Repercussions

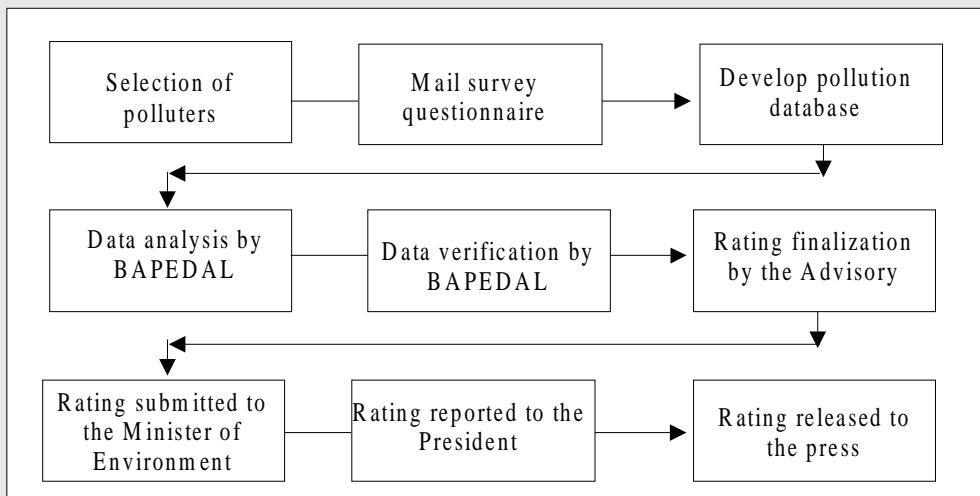
International business magazines routinely report on the business interests of some senior Indonesian political and military figures. If all facilities owned by such individuals deserved blue or higher ratings, then BAPEDAL would not have a problem: the rating system stood to make powerful friends. Given the relatively recent introduction of water pollution regulations and their weak enforcement, however, this scenario was too good to be true. Some of the facilities owned by well-connected figures would surely deserve red or black ratings. BAPEDAL needed to formulate a strategy to avoid turning those figures into formidable enemies.

Acting on the advice of politically savvy supporters, BAPEDAL decided to release initially the names of only those facilities earning green or gold ratings. This would give the system a positive image. For the remaining facilities, it decided to release initially just the number in each color category. This would demonstrate that it was indeed serious about "awarding" red or black ratings to facilities that were out of compliance. Finally, it decided to give the facilities whose identities were initially suppressed six months to improve their performance before it disclosed their names and ratings. This would give their owners a one-time chance to avoid public loss of face.

To sustain interest in the system and keep it in the news, BAPEDAL decided not to identify all the blue, red, and black facilities simultaneously. Instead, it decided to release their names and ratings industry by industry. It chose to release information first on pulp and paper mills and rayon factories, which comprised some thirty facilities owned by three large companies, followed by textile mills and other sectors.

To speed institutionalization of the system, BAPEDAL proposed it as an extension to PROKASIH, instead of as a new program. This was reasonable, given the system's initial focus on water pollution and the 176 facilities that were already participating in PROKASIH. Hence, when the program was

**Figure 5**  
**Performance Rating Process**



announced to the public, it was given the official name PROPER PROKASIH.

### III. Performance of PROPER

In June 1995, the Minister of Environment publicly awarded green ratings to 5 facilities. The media gave heavy coverage to the awards, and the companies receiving them reaped much favorable publicity. As planned, the Minister also disclosed the distribution of the ratings for, but not the identities of, the remaining 182 facilities. Most received red ratings (115), and a few received black ratings (6). None received gold ratings. The percentage of those receiving blue ratings (61 facilities) or green ratings was more than a third of the total, 36 percent. That this percentage was so high surprised BAPEDAL and probably most of the Indonesian public, given the prevailing weakness of enforcement. It provided additional evidence that a semi-voluntary program like PROKASIH could induce notable progress toward pollution reduction in a developing country like Indonesia.

BAPEDAL met with the owners of several companies receiving red and black ratings and urged them to improve their performance during the six-month grace period. Faced with the threat of public disclosure, many companies took advantage of the opportunity and did so. In several cases, it turned out that plant managers had misinformed owners about the compliance status of their factories; once owners were better informed by the ratings, they issued stern instructions to reduce pollution. By December, when the Minister began disclosing the names and ratings of all facilities, the number of black ratings fell by half, from 6 to 3, and the number of red ratings fell from 115 to 108 (Table 1). As a result, the number of blue ratings—that is, the number of facilities just meeting the basic requirements for compliance—rose by nearly a fifth, from 61 to 72. The number of green ratings fell by one, but even that was a sign of PROPER's effectiveness. One of the facilities that had been awarded a green rating in June was downgraded in response to protests by a

community living in the vicinity of the facility. This incident demonstrated that PROPER could succeed in augmenting the ranks of BAPEDAL's inspectors by empowering communities to verify the accuracy of the ratings.

In just six months, PROPER raised the compliance rate from 36 percent to 41 percent. A sign of industry's confidence in the program was that no facility, not even the one whose rating was changed from green to black, protested its rating. Another sign was that the number of facilities that contacted BAPEDAL to volunteer in the program more than doubled, from 11 to 25.

Performance varied considerably across industry groups (Table 2). In two cases, paper and sugar, more than half the facilities received blue ratings, although none received green. In three others, however—rubber, textiles, palm oil—more than three-fourths received red or black ratings. Just over two thirds of plywood mills received red or black ratings. From an aggregate "compliance/noncompliance" standpoint, plywood mills would appear to be better performers than rubber, textile, or palm oil mills. But nearly a quarter of the plywood mills that were out of compliance received black ratings, compared to none of the rubber and palm oil mills and only a small portion of the textile mills. PROPER gave insights into the degree of noncompliance that had previously not been available.

Performance also varied across ownership categories (Figure 6). Facilities privately owned by Indonesian nationals were the worst performers: nearly 70 percent of their ratings were red or black. Facilities owned by multinational companies were the best performers: nearly 80 percent of their ratings were blue or green. The performance of state-owned facilities fell between these two extremes, with almost equal numbers being in compliance and out of compliance. The strong performance of multinationals has several possible explanations. One, which is consistent with the motivation behind PROPER, is that multinationals sell their products primarily to developed countries, where "green consumerism" is stronger than in Indonesia, and are owned primarily by shareholders from those countries, who might be more environmentally inclined than the average Indonesian capitalist. On the other hand, multinationals tend to be larger than Indonesian-owned companies, and their greater size might offer economies of scale that make environmental management more affordable. Some evidence suggests that this second explanation is more likely: the World Bank study of facilities participating in PROKASIH found that the performance of multinationals did not differ from that of Indonesian-owned companies once differences in size were taken into account.<sup>10</sup> This suggests that the Indonesian business community responds to reputational incentives just as strongly as the international business community.

The most recent available information indicates that facilities participating in PROPER continue to improve their performance. More than a quarter of the facilities rated red or black in December 1995 improved their ratings to blue or green by September 1996 (Figure 7).

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<sup>10</sup> Pargal and Wheeler, *op cit.*



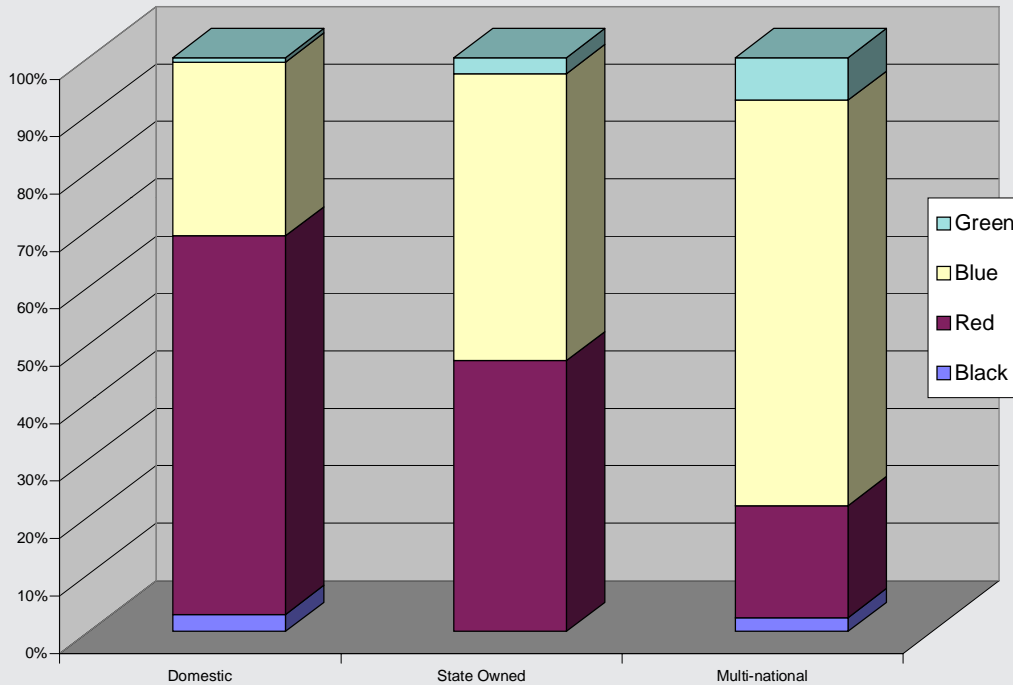
**Table 1**  
**The Short-Term Impact of PROPER**

<i>Rating</i>	<i>Number of facilities: June, 1995</i>	<i>Number of facilities: December, 1995</i>	<i>Percentage change, June-December</i>
Gold	0	0	0%
Green	5	4	-20%
Blue	61	72	+18%
Red	115	108	-6%
Black	6	3	-50%

**Table 2**  
**Distribution of Ratings by Industry Type (percentages)**

<i>Rating</i>	<i>Sugar</i>	<i>Paper</i>	<i>Plywood</i>	<i>Textile</i>	<i>Palm oil</i>	<i>Rubber</i>
Green	0	0	0	4	0	0
Blue	67	55	32	20	24	15
Red	33	45	52	72	76	85
Black	0	0	16	4	0	0

**Figure 6**  
**Performance by Ownership Type**



#### IV. Questioning PROPER's Performance

The apparent importance of size in determining facilities' environmental performance raises a question about the ultimate impact of PROPER on Indonesian water quality. PROPER, and PROKASIH before it, include mainly larger enterprises. Yet, most enterprises in Indonesia are small or medium-sized. Many are not well-known to the public, in terms of either their names or the products they sell. Can PROPER be extended to include the thousands of small and medium-sized enterprises in Indonesia, and if so, is it likely to be effective?

For that matter, will BAPEDAL be able to sustain PROPER's apparent effectiveness within the group of the 187 original facilities once the program's novelty wears off and the media move on to other stories? How much of PROPER's initial success has been due to the care BAPEDAL took in selecting facilities with good data, which might be the facilities that were already more capable of managing their environmental performance, and its skill at enlisting the support of political allies, whose attention and interest might wane as other pressing issues arise? Can PROPER succeed once it becomes just another, familiar government program, and must include facilities with poor data as well as good?

The World Bank study of facilities included in PROKASIH raises a third set of questions.<sup>11</sup> After controlling for enterprise size and other important variables, the study found that environmental performance was much worse in poorer, less educated communities: facilities located in municipalities in the

<sup>11</sup> Pargal and Wheeler, *op. cit.*

bottom 25 percent of income and education distributions had a water pollution intensity that was *15 times as large* as the pollution intensity of facilities in municipalities in the top 25 percent. The study concluded that this difference was more likely due to differences in the relative power of the communities than to differences their preferences. Does this imply that PROPER is likely to work well only in the more affluent and better educated parts of Indonesia? If so, might public pressure in such communities induce polluters to relocate to weaker communities, thus making rich communities cleaner and poor communities more polluted?

This is an issue of equity. A fourth, and final, set of questions has to do with efficiency. The discharge standards specified in KEP/MEN/03/1991 are uniform within the 14 industries to which they apply: that is, although standards may vary between palm oil mills and rubber mills, they do not vary between palm oil mills on rivers with downstream communities and palm oil mills on rivers without downstream communities. These uniform standards are probably not economically justified, if one takes into account differences in pollution damages. Most likely, pollution from a mill on a river without downstream communities generates less economic damage than pollution from a mill on a river with downstream communities. Allowing the former mill to discharge more pollution would reduce its abatement costs, and these cost savings might well outweigh the incremental damage caused by the additional pollution. PROPER is designed to put pressure on enterprises to improve their environmental performance, but its ratings are based on the uniform standards in KEP/MEN/03/1991. Does PROPER therefore unfairly penalize facilities whose pollution is unlikely to cause serious problems? If so, and if such facilities respond to public pressure by reducing pollution to earn a blue or green rating, how much money might they needlessly spend in the process?

**Figure 7**  
**Compliance Trend**

