

# TRASH, CITIES, AND POLITICS: URBAN ENVIRONMENTAL PROBLEMS IN INDONESIA

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Indonesia became an urbanized country in less than two generations. As urbanization accelerated, trash accumulated. In large cities, the amount of garbage increased exponentially and environmental quality declined significantly. The government tried to address urban environmental issues starting in the 1980s, but this has been a relative failure because policy implementation has been poor due to corruption, public agencies' weak commitment to spending on environmental issues, and local government authorities' low awareness of the issues. There is, however, one environmental program that has been successful: ADIPURA, started in 1986 and still active today in more than 380 cities.<sup>1</sup> The program focuses on evaluating city-level waste management and cleanliness, and relies on inspections and public disclosure of its results. Implementing ADIPURA requires extensive data collection on participating cities, and each year an ADIPURA contest is organized to recognize the cleanest cities in Indonesia. The mayors of the winning cities receive a prize from the hands of the president on June 5, International Environment Day, at an event extensively covered in the media.

ADIPURA was successfully implemented between 1986 and 1998 and was an immediate success. Its basic idea—that reputation and public disclosure motivate city

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<sup>1</sup> According to the Indonesian dictionary *Kamus Besar Bahasa Indonesia* (kbbi.web.in, accessed November 15, 2014), “adipura” means cleanest and most beautiful city (*kota yg terbersih dan terindah*). “Pur” or “pura” is a Sanskrit suffix meaning city, as in, for example, Jaipur, Khanpur, Singapore, and Kuala Lumpur.

leaders to deliver public services to its citizens—was straightforward. The early success of the ADIPURA program demonstrated that, even though the enforcement of laws was weak in Indonesia, reputational incentives were effective instruments. This strategy, embodying the idea of “honor and shame,” was well suited for Indonesian culture. According to an Indonesian expert on waste management, municipal performance on waste management “was relatively sound during 1990–1995, when many cities were being motivated to improve their cleanliness/sanitation due to, inter alia, the existence of [the] ADIPURA program.”<sup>2</sup>

What observers did not notice at the time, however, is that the program’s success was linked to the autocratic nature of the regime and to the influence of President Suharto, who appointed mayors. Mayors were accountable to the president, not to their communities. ADIPURA was re-launched in 2002 after a pause of a few years. By then, Indonesia had become a democratic, decentralized nation. Decentralization blunted the incentive effects of ADIPURA, which became less effective and, as a result, city cleanliness declined. The program was also undermined by corruption, as exemplified by a famous investigation by the Corruption Eradication Commission (KPK, Komisi Pemberantasan Korupsi), which resulted in jail for the mayor of Bekasi (as I explain later). In recent years, waste management—including handling trash and operating landfills—became the responsibility of local governments—*kota* (towns) and *kabupaten* (districts)—but it is not a priority for them. Because of budget shortages, poorly trained local officials, and a lack of political will, waste management in Indonesia deteriorated.

Although the program is thirty years old, it has never been seriously studied. In this paper I use disaggregated data on ADIPURA inspections, public-spending data, and socio-economic indicators for 309 cities in recent years to analyze how this environmental program has affected cities. However, before I do that, it is worth recounting the short and unfortunate history of Indonesia’s urban environmental policies.

### Urbanization and the Growing Environmental Malaise

Modern urban growth in Indonesia began in the 1870s.<sup>3</sup> The share of urban populations jumped from 3.8 percent in 1930 to 17.1 percent in 1960 and 52.6 percent in 2009. Today, Indonesia’s total population is 260 million people. Between 1960 and 2009, the population grew at a rate of 1.9 percent per year, but the urban population grew at a rate of 4.6 percent per year. More than 90 percent of the urban population is located in Sumatra, Sulawesi, and Java-Bali, the latter region having by far the largest urban population.<sup>4</sup> Urbanization is linked to economic growth, but, as

<sup>2</sup> Enri Damanhuri, “Some Principal Issues on Municipal Solid Waste Management in Indonesia” (paper presented at the Expert Meeting on Waste Management in Asia and Pacific Islands, October 27–29, 2005, Tokyo).

<sup>3</sup> It began with the expansion of Batavia [Jakarta], Surabaya, Bandung, Yogyakarta, Surakarta [Solo], Semarang (on Java), and Medan and Palembang (on Sumatra). The term “city” was first given administrative meaning with the creation of municipalities in 1903. See Robert Cribb, *Historical Dictionary of Indonesia* (Metuchen and London: Metuchen Press, 1992).

<sup>4</sup> According to the latest official census, Indonesia had 237 million people living on its 17,508 islands in 2010. This amounted to a population density of about 124 people per square kilometer (323 per square

shown by Blane Lewis, the pace of urbanization is negatively correlated with economic output.<sup>5</sup> A plausible explanation for this result is that the speed of Indonesia's urbanization has overwhelmed the government's ability to meet infrastructure needs. Therefore, it is not the pace of urbanization per se that negatively affects growth, but rather the government's inability to invest sufficiently in the required infrastructure, a failure that also abets congestion, pollution, and health problems. Time-series data show that local governments that invest heavily in infrastructure are able to cope somewhat with the apparent detrimental effects of rapid urbanization on economic growth.

As Indonesia's urbanization accelerated, pollution of all kinds increased. One of the main issues is solid-waste management—the others being air and water quality.<sup>6</sup> The amount of garbage in big cities and metropolitan areas is increasing exponentially, contributing to a degradation of environmental quality.<sup>7</sup> Domestic waste and toxic and hazardous pollution cases also increased. Solid waste per capita increases as incomes rise and, in cities, the amount of solid waste expands more than twice as fast as the rate of population growth. At present, between 15 and 40 percent of waste is not getting collected at all. As a result, much ends up in uncontrolled dump sites, leading to leachates that contaminate groundwater and contributing to the proliferation of disease-carrying pests. Some uncollected wastes are burned, adding to urban air pollution, and an estimated 30 percent ends up in rivers and canals, where it can contaminate water in low-lying residential areas.<sup>8</sup>

As a result of rapidly deteriorating conditions, as well as pressure from local environmental NGOs, international NGOs, and aid agencies, the Indonesian government began to respond to urban environmental problems in the early 1970s. But as many international agencies have observed,<sup>9</sup> the impact of urban environmental policy has been minimal and the welfare of the urban population has continued to deteriorate. The new policies put in place show that authorities have good intentions but are not willing to walk the talk: the actual implementation of new policies has

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mile). Java-Bali is the most urbanized region, with 50 percent of its population being urban, but the rate of urbanization growth in regions like Kalimantan, Nusa Tenggara, and Papua is faster than in Java-Bali.

<sup>5</sup> Blane D. Lewis, "Urbanization and Economic Growth in Indonesia: Good News, Bad News and (Possible) Local Government Mitigation," *Regional Studies: The Journal of the Regional Studies Association* 48, 1 (2014): 204.

<sup>6</sup> Unsafe water is one of the major sources of disease in Indonesia, and the lack of adequate sanitation facilities is the primary cause of contamination of urban water supplies. Few Indonesian cities have a sewerage system, so most households rely on private septic tanks or dispose of human waste directly into rivers and canals. Air pollution is also increasing sharply. The critical level for several pollutants—including suspended particulate matter, lead, sulphur dioxide, and nitrogen oxides—exceeds national ambient quality standards, especially in areas of heavy traffic. Vehicle emissions are the largest and most rapidly growing source of urban air pollution. The level of industrial pollutants in Indonesian cities—assuming current policies and practices—is also expected to expand greatly in the future.

<sup>7</sup> In the terminology of KLH (Kementerian Lingkungan Hidup, Ministry of the Environment), metropolitan areas have more than 1 million inhabitants; large cities, between 500,000 and 1 million; medium-size cities, between 100,000 and 500,000; and small cities, fewer than 100,000 inhabitants.

<sup>8</sup> Indonesian Center for Environmental Law, "Environmental Compliance and Enforcement in Indonesia Rapid Assessment," study conducted by ICEL in collaboration with the Indonesian Ministry of Environment and the Secretariat of Asian Environmental Compliance and Enforcement Network, financed by USAID Regional Development Mission/Asia (2008).

<sup>9</sup> See, for example, World Bank, "Investing in a More Sustainable Indonesia," Country Environmental Analysis, Report No. 50762-ID (Washington, DC: World Bank, 2009).

been abysmal due to widespread corruption, public agencies' weak commitment to the policies, local government officials' low awareness of the problems and solutions, and capacity challenges at all levels. Among the more educated segments of the population, awareness of the damaging environmental impact of economic growth is low and there are few stakeholder mechanisms to hold public agencies accountable for their performance. Environmental considerations are not integrated into policy-making processes, especially in public investment planning. Under the current (decentralized) institutional framework, subnational governments do not feel bound by national guidelines and the civil service is no longer part of a unified chain of command, as regulatory bodies in many provinces and districts do not fall directly under the command of the governor or district head. Overall, the cumulative effects of rising population density and urbanization, poor policy implementation, and low public awareness of environmental issues have impacted the Indonesian urban environment negatively.

### Urban Waste-management Policy under Suharto

The negative consequences of economic growth on public health and the environment, along with an increasing international awareness concerning environmental policy, led in 1978 to the creation of the Ministry of the Environment (now called Kementerian Lingkungan Hidup, KLH). KLH was helped by the rise in the citizenry's educational levels and the emergence of a middle class increasingly concerned with the negative effects of rapid economic growth on the quality of life. The fact that environmental problems were being addressed owed much to the personality of the first minister of the environment, Professor Emil Salim. Both internationally and within Indonesia, Salim's articulate speeches brought home to the general public the need to pay attention to the sustainability of their environment.<sup>10</sup> With assistance from international organizations and NGOs, Salim developed a national environmental strategy, including the conservation of genetic resources and biodiversity; the preservation of unique ecosystems; and, in 1980, the creation of the country's first five national parks. These policies were the product of the Western technocratic arguments adopted by the "Berkeley mafia," reinforced by the fact that some of the negative externalities of liberal policies—in particular, the bad consequences of logging—were becoming apparent.<sup>11</sup>

Dealing with environmental issues resulting from urbanization, however, required a broader approach than that promoted by Salim. The industrialization boom of the nineties benefited millions of Indonesians, but it was accompanied by pollution, environmental degradation, and increases in waste that were considered intolerable by the public. It was clear that dealing with environmental risks required a strong

<sup>10</sup> Colin MacAndrews, "Politics of the Environment in Indonesia," *Asian Survey* 34, 4 (1994): 369–80.

<sup>11</sup> The Ministry of Environment was not a powerful department, but Salim had the ability to attach environmental issues to other items on the political agenda; see Robert Cribb, "The Politics of Environmental Protection in Indonesia" (working paper, Monash University Centre of Southeast Asian Studies, 1988). For instance, instead of defending forest destruction as the necessary price for national development, Salim criticized the West for its hypocrisy in demanding that Indonesia conserve its forests while at the same time being the principal consumer of products from those forests and perpetuating an international economic order that gave Indonesia no choice but to exploit the forests.

incentive system to motivate politicians to reduce pollution. KLH could do little to control pollution because there was no environmental legislation to back this new agency.<sup>12</sup> In 1982, an Environmental Management Act (EMA) enabled KLH to develop environmental standards and issue licenses. But the law failed to provide KLH with full enforcement authority—indicating, perhaps, that Suharto was still hesitant to give KLH free rein. The EMA, however, explicitly stated the need to make the public aware of its environment and recognized the rights of NGOs to act in the interest of communities. This fundamentally changed the dynamic of environmental policy in Indonesia. The 1982 law set the foundation for key environmental initiatives, including ADIPURA, PROKASIH (Program Kali Bersih, Clean River Program), and PROPER (Program Penilaian Peringkat Kinerja Perusahaan, Program for Pollution Control Evaluation and Rating), three of KLH's public-disclosure programs. (I'll say more about public-disclosure strategies and programs below.)

The limitations of the EMA forced KLH to get creative about regulations and motivated them to experiment with new instruments that did not rely on formal enforcement. KLH initially focused on raising environmental awareness among the general public, and Salim sought support from the environmental NGO movement. In 1980, KLH helped create the Indonesian Environmental Forum (Wahana Lingkungan Hidup Indonesia, WALHI), the largest forum of NGOs and community-based organizations in Indonesia.<sup>13</sup> The central government did not seem to be disturbed by this development, as NGOs were considered to be nonpolitical. Some say that WALHI was, indeed, like a safety valve for Suharto, as it allowed those who were social activists by nature to exercise their activism without posing a real threat to the establishment.<sup>14</sup> Salim also contributed to the establishment of environmental research centers throughout the country and encouraged his staff to get training in foreign universities. Under President Suharto's regime, although some local communities put pressure on public officials to improve their cities' sanitary conditions, citizens generally lacked any real bargaining power. Local authorities were similarly constrained; mayors were appointed by the central government—often by President Suharto himself—and were not held directly accountable to their communities.

<sup>12</sup> The five-year development plans REPLITA II and III included environmental management as a policy goal, but the critical milestone was the Environmental Management Act enacted on March 11, 1982. It enabled KLH to develop environmental standards and issue licenses, and served for fifteen years as the basis for regulatory decisions until it was replaced by a new law on September 17, 1997.

<sup>13</sup> WALHI's membership included professional organizations concerned with environmental matters, a large number of groups like the Mapala associations and single-issue activist environmentalist organizations like SKEPHI (Sekretariat Kerjasama Pelestarian Hutan Indonesia, Secretariat for Forest Conservation in Indonesia) and KRAPP (Kelompok Relawan Anti Penyalahgunaan Pestisida, Indonesian Pesticides Action Network). Other groups have focused on issues such as pollution and city planning, urging changes in government policy and conducting research to back their views. These environmental groups work closely with other pressure groups; for instance, the president of WALHI in the late 1980s, Abdul Hakim Garuda Nusantara, was a former head of the Jakarta Legal Aid Institute (Lembaga Bantuan Hukum, LBH), a political thorn in the government's side. Most environmentalist groups have fluctuated between being banned and being compulsorily incorporated into government-sponsored structures in which they lose all freedom of action. The NGOs have generally been scrupulously careful to stay within the law and have endeavored to promote the rule of law (see Cribb, "The Politics of Environmental Protection in Indonesia").

<sup>14</sup> See David Potter, *NGOs and Environmental Policies: Asia and Africa* (London: Frank Cass, 1996; reprinted in Taylor and Francis e-Library, 2005), 14–15.



One way to redress the lack of accountability in local governance is through disclosure programs. Disclosure programs are useful mechanisms for monitoring and control, first used internationally in the 1980s. The United States created the Toxic Release Inventory after the 1984 Union Carbide chemical disaster in Bhopal, requiring manufacturing firms to publicize the emissions that they release to air, water, and land. The data gathered allow authorities to set measurable policy priorities and are a prerequisite for voluntary agreements, eco-taxes, and other regulatory instruments. Data collection is also a signal that the authorities are serious, and that signal, in itself, can have important effects.<sup>15</sup> In developing countries like Indonesia, as per capita income increases, the demand for information about environmental news increases. Media are motivated to investigate environmental issues thoroughly, and their reports improve governance by empowering local communities to take action.<sup>16</sup>

ADIPURA, a disclosure program, was created in 1986, only two years only after the pioneering US program. The objective was to subject mayors to the scrutiny of both the central government and the public, and to provide public recognition for good performers. A subsidiary objective, after the creation of WALHI, was to use local environmental NGOs to enhance awareness among local communities and increase the local demand for a healthy environment. Implementing ADIPURA required extensive data collection about waste management and other aspects of urban cleanliness.<sup>17</sup> The information had to be processed, tabulated, and disclosed to the

<sup>15</sup> Information disclosure—to inform the public or for regulatory compliance—is widespread around the world. For empirical assessments, see: Seema Arora and Timothy Cason, “Do Community Characteristics Influence Environmental Outcomes? Evidence from the Toxic Release Inventory,” *Southern Economic Journal* 65 (1999): 691–16; Jorge García, Shakeb Afsah, and Thomas Sterner, “Which Firms are More Sensitive to Public Disclosure Schemes for Pollution Control? Evidence from Indonesia’s PROPER Program,” *Environmental and Resource Economics* 42, 2 (2009): 151–68; Jorge García, Thomas Sterner, and Shakeb Afsah, “Public Disclosure of Industrial Pollution: The PROPER Approach for Indonesia?” *Environment and Development Economics* 12 (2007): 739–56; Eungkyoon Lee, “Information Disclosure and Environmental Regulation: Green Lights and Gray Areas,” *Regulation, and Governance* 4, 3 (2010): 303–28; Sheoli Parga and David Wheeler, “Informal Regulation of Industrial Pollution in Developing Countries: Evidence from Indonesia,” *Journal of Political Economy* 104, 6 (December 1996): 1314–27; and David Weil, Archon Fung, Mary Graham, and Elena Fagotto, “The Effectiveness of Regulatory Disclosure Policies,” *Journal of Policy Analysis and Management* 25, 1 (2006): 155–81. About cities, see: Laura Bianchini and Federico Revelli, “Green Politics: Urban Environmental Performance and Government Popularity” (Università di Torino Department of Economics, Working Paper No. 04/2011, 2011). There is also a political economy literature on program performance at local government levels that is relevant for the Indonesian ADIPURA program; see Tim Besley and Robin Burgess, “The Political Economy of Government Responsiveness: Theory and Evidence from India,” *The Quarterly Journal of Economics* 117, 4 (2002): 1415–51; Claudio Ferraz and Fred Finan, “Electoral Accountability and Corruption: Evidence from the Audits of Local Governments,” *American Economic Review* 101, 4 (2011): 1274–311; and John List and Daniel Sturm, “How Elections Matter: Theory and Evidence from Environmental Policy,” *Quarterly Journal of Economics* 121, 4 (2006): 1249–81.

<sup>16</sup> Joseph Gyourko, Matthew Kahn, and Joseph Tracy, “Quality of Life and the Environment,” in *Handbook of Regional and Urban Economics*, Vol. 3, ed. Paul Cheshire and E. S. Mills (Amsterdam: North Holland, 1999), 1413–54.

<sup>17</sup> ADIPURA focuses on cleanliness of cities and waste management. The process of inspection, method of analysis of the data, and awards to deserving cities is regulated today by KLH Decree No. 07-2011, amended by KLH Decree No. 01-2013. The decrees specify that monitoring teams must collect physical and institutional indicators in all cities of more than 100,000 inhabitants through inspections, spot checks, and questionnaires sent to local authorities. For each city, close to two hundred inspection observations are scored and recorded. The areas that are inspected include urban housing, roads, markets, schools, hospitals, commercial centers, river banks, bus terminals, airport facilities, seaport and railway

media. The mayors whose cities met pre-established environmental requirements received a highly publicized prize on June 5, International Environment Day.<sup>18</sup>

In 1986 only two cities met ADIPURA's Clean City requirements, but, by 1997, this number had increased to 273—a clear indication of the success of the scheme. Much of the success of the program was driven by the mayors' desire to avoid losing face vis-à-vis the president and their peers. Since its inception, as mentioned in a 2013 *Jakarta Post* op-ed, the ADIPURA Award has been used as “sticks-and-carrots” to encourage Indonesian cities and urban regions to be “clean and green.”<sup>19</sup> ADIPURA awards have been given every year since 1986 except for a few years starting in 1998 because of the financial crisis and the fall of Suharto.<sup>20</sup> When Nabel Makarim, who had been vice minister under Salim, became minister of the environment, the program was relaunched in Denpasar (Bali) on June 5, 2002—under Megawati's presidency—and continues to this day. It continues to be a prominent environmental initiative of the Ministry of Environment and regularly receives press coverage. The participation of cities increased between 2002 and 2008 and, in 2008, the program became mandatory for cities of more than 100,000 inhabitants.

The early success of the ADIPURA program confirmed that reputational incentives were effective instruments even in a context where the enforcement of rules is weak. This strategy of “honor and shame” was well suited for the Indonesian culture. Within three years, because of the success of ADIPURA, KLH created two other disclosure programs: PROKASIH, a voluntary public disclosure program (now stopped) that put pressure on provincial governors to reduce effluent discharges into the rivers, followed by PROPER (still active), a program to reduce industrial pollution, developed with World Bank assistance.

### Urban Waste Management after Decentralization

Until 2007, Indonesia did not have a national waste policy and ADIPURA was one of the few policy instruments that could make a difference in terms of urban cleanliness. Municipal solid-waste management was the responsibility of several agencies and ministries such as Public Works; Home Affairs; Health; Technology Assessment Agency (Badan Pengkajian dan Penerapan Teknologi, BPPT); Environmental Impact Management Agency (Badan Pengendalian Dampak Lingkungan, BAPEDAL); and Subdirectorate for Solid Waste Management. This led to

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stations, and all types of waste management facilities, including temporary waste disposal sites, landfills, sewage systems, and wastewater processing facilities.

<sup>18</sup> Every year, an ADIPURA contest is organized for the cleanest city among metropolitan, large, medium, and small cities in Indonesia. Additional categories include the best city for urban green spaces, markets, and parks.

<sup>19</sup> <http://www.thejakartapost.com/news/2013/03/05/sticks-and-carrots-urban-waste-management-indonesia.html>, accessed November 15, 2014.

<sup>20</sup> The political crisis started to develop in Indonesia in 1996. President Suharto resigned under pressure in May 1998 and was replaced by his trusted ally B. J. Habibie. In early 1997, there was massive capital flight out of Southeast Asia (partly as a result of financial scandals, such as the Bre-X gold scandal), inaugurating a major financial and economic crisis for the region. See Adrian Vickers, *A History of Modern Indonesia*, 2nd edition (Cambridge: Cambridge University Press, 2013), 209.

overlapping responsibilities and weak enforcement of solid-waste-management laws and regulations.

This state of affairs changed when Indonesia became a decentralized nation. Spending responsibilities, including waste management, devolved to local governments.<sup>21</sup> Since 2004, the central government is required to transfer at least 26 percent of domestic net revenues (domestic revenue minus revenue sharing) to lower levels of government. Ten percent of the transfer goes to provincial governments and 90 percent to *kota* and *kabupaten*, which carry out the bulk of expenditure responsibilities for waste-management and environmental programs. These transfers are the main source of revenue for *kota* and *kabupaten*, but the current system relies primarily on untied transfers over which local governments have full discretion. The main revenues available to *kotas* and *kabupatens* are the general allocation grant (*Dana Alokasi Umum*, DAU), accounting for 60 percent of the total; the intergovernmental specific-purpose grant (*Dana Alokasi Khusus*, DAK); shared taxes and revenues; and own-source (tax and nontax) revenues. All significant taxes, including value-added tax, personal income tax, and corporate income tax, remain under the control of the central government. There is a large fiscal gap between local level revenues and expenditures.

Before 1997, mayors who won the ADIPURA prize often had their term extended by President Suharto, thus the political benefit of winning the Clean City award was obvious. A few years after decentralization in 1999, a Presidential Decree on Waste Management (Nr. 2/2002) was adopted and public responsibilities were radically transformed, with the central government playing the role of regulator and local governments the role of policy-implementation agents. In 2008, Parliament adopted Waste Management Law No. 18/2008, which covers public-service principles concerning waste management.<sup>22</sup> As a result, four ministries are responsible for waste management: the Ministry of Environment took over the responsibility of BAPEDAL and is in charge of controlling the impact of environmental pollution; the Ministry of Public Works has the responsibility to guide and finance construction in solid-waste-management infrastructure, such as sanitary landfills; BAPPENAS, the Ministry of National Development (Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional), is in charge of waste-management-planning

<sup>21</sup> Decentralization was approved by Parliament in 1999. Two important laws on subnational governance and on fiscal decentralization were approved in 2004. Administratively, Indonesia consists of four government levels: central, provincial, district (*kabupaten* and cities [*kotamadya*]), and village (urban *kelurahan* and rural *desa*). Local and provincial governments are autonomous entities. At the end of 2004 there were 33 provinces, about 440 *kabupaten*, and 100 *kota*, and approximately 80,000 villages. The average province population is seven million, ranging from fewer than a million in North Maluku to more than thirty-eight million in West Java. The average local government population is about 480,000 people. District populations range from 25,000 in Sabang to four million in Bandung. Local governments also differ vastly in their geographic and socioeconomic characteristics. Per capita incomes in the richest 20 percent of districts are more than three times higher than in the poorest 20 percent of districts, reflecting large disparities in living conditions.

<sup>22</sup> This section draws on: Australian Aid, "Scoping Study for Solid Waste Management in Indonesia" (Indonesia Infrastructure Initiative, Jakarta, 2012); Enri Damanhuri and Tri Padi, "The Role of Informal Collectors of Recyclable Waste and Used Goods in Indonesia," in *Post-Consumer Waste Recycling and Optimal Production*, ed. Enri Damanhuri (Rijeka: InTech, 2012), <http://www.intechopen.com/books>, accessed November 15, 2014; and Indonesian Center for Environmental Law, "Environmental Compliance and Enforcement in Indonesia Rapid Assessment."



and financial planning; and the Ministry of Housing and Regional Infrastructure provides technical guidance and supervises large-scale, off-site waste-management systems. Moreover, the 2008 law gave *Kotas* and *kabupatens* more responsibilities in planning and implementing solid-waste management in their locality. Municipalities sometimes hire private companies to collect street waste in commercial areas. In cities like Jakarta, Bandung, and Surabaya, some large commercial and industrial enterprises employ the city's Cleansing Department or hire private contractors. At the provincial level, local boards of environmental management are responsible for controlling environmental pollution, and thus create Provincial Sanitary Landfills (Tempat Pembuangan Sampah Terpadu, TPST) as a means to alleviate waste-dumping practices.<sup>23</sup>

The central-government budget allocation for environmental functions—which goes to several ministries and public agencies—represented 1 percent of the overall budget in 2008. The allocation for environmental functions going to KLH has been decreasing, from around 17 percent in 2005 to 7.7 percent in 2008. At local government levels, the waste-management budget comes from several sources, including locally generated revenues and the central government's Special Allocation Fund, DAK. Local budgetary policies vary. Governments in Sulawesi, Maluku, and Papua regions, for example, agreed in 2008 to allocate 3 to 5 percent of their budgets to environmental issues.

Budget figures for ADIPURA are not available, but an approximate figure for KLH would be IDR 10 billion (about US\$825,000). In addition, each *kota* and *kabupaten* has a small budget for ADIPURA. If we estimate an average of \$100,000 per city for inspections (including travel and hotel costs for the monitoring team), which is probably an underestimation, that would add up to US\$40 million for four hundred cities. Thus, the total government cost for ADIPURA per year could easily exceed US\$41 million, or IDR 500 billion per year. ADIPURA is not a cheap program.

As shown on the next page in Table 1, 38.5 million tons of solid waste is generated annually by the 232 million inhabitants in Indonesia (450 gram per person per day), of which 21.2 million tons are on Java.

The twenty-six biggest cities in Indonesia account for 40 million people and generate an estimated 14 million tons of solid waste per year (or 1 kg per person per day). DKI Jakarta alone generates about 2.2 million tons per year. Municipal waste generally comprises 62 percent organic material; 14 percent plastics; 9 percent paper; 2 percent each of glass, rubber or leather, and metals; and 13 percent "other." An estimated 56 percent of the population (130 million people) lives in areas where municipal waste collection services are available. In Java, 59 percent of the population (80.8 million) has access to municipal waste collection.<sup>24</sup>

<sup>23</sup> The TPST decision was partly triggered by a spontaneous explosion and landslide in 2005 at the Leuwigajah dump site. This disaster was related to the height of waste piles on an unprotected dumpsite, and caused forty-one casualties. Proper sanitary landfills are designed with liners, soil protections, groundwater monitoring, and landfill gas processing. Some of the TPSTs will have anaerobic composting and landfill gas facilities to generate energy. Some eighteen regional sanitary landfills are under consideration but none are in operation.

<sup>24</sup> Some 16.7 million tons of waste is *not* collected by municipal services, but by the communities themselves. That waste is mainly transported to regulation dump sites, but in some cases it is buried

Table 1: Waste Generation and Collection in Indonesia, 2006

Region	Population	Total Waste Generated	Waste Generated per Person	Population Being Served	Actual Waste Collected	Waste Generated but not Collected
Sumatra	49.3	8.7	0.48	23.4	4.13	4.57
Java	137.2	21.2	0.42	80.8	12.49	8.71
Balinasra	12.6	1.3	0.28	6.0	0.62	0.68
Kalimantan	12.9	2.3	0.49	6.0	1.07	1.23
Totals*	232.8	38.5	0.45	130.4	21.72	16.78

\* Millions of tons. Source: KLH, Department of Environmental Pollution Control

Waste collected by the municipalities is mainly done by small handcarts, and brought to small transfer sites or collection points (TPS, Fasilitas Pengolahan Sampah). These TPS, of which there are about fifty-nine thousand, basically consist of open dump areas, sometimes including six-cubic-meter storage containers, and sometimes accommodated by little more than a roof and some paved surface underneath. They are often overwhelmed with rotting organic substances, flies and rodents, and other hazards, which pose public health risks. At some TPS operations, composting activities take place and valuables are removed by waste scavengers.

The collected waste is transported to one of the estimated 537 central dumpsites (TPA, Tempat Pembuangan Akhir). Most municipalities operate their own dump site within the city boundaries, and most of these sites lack a lining or other soil and groundwater protection, thereby causing a direct negative impact on nearby water resources and the environment. About 40 percent of the dumpsites have some kind of leachate monitoring, collection, and treatment system, mainly through simple sand filtration technologies. Landfill gas treatment is hardly applied. As a result, solid-waste dumpsites throughout Indonesia emit an estimated 900 tons of methane each year.

Central dumpsites are favorite spots for scavengers, who pick waste valuables. It is estimated that fifty thousand scavengers continuously operate at these dumpsites throughout Indonesia. Numerous other waste pickers operate in the waste collection circuit and at the tens of thousands of small TPS. A limited number of municipalities operate modest composting or incineration facilities.

According to an Indonesian expert on waste management, the main factor responsible for nonexistent or inferior waste management is local autonomy, the

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underground, composted, burned in the open air, or thrown into rivers—strategies that pose serious risks for public health and the environment.

absence of trained officials, and limited revenue. There is no political will on the part of local government executives and elected officials to give priority to trash removal and waste disposal. Moreover, the dominant view is that waste management is not a profitable business, and this hinders private sector participation. Neither households nor local officials are willing to pay a fee to cover operating costs, maintenance expenses, and depreciation. The result is that all waste-management facilities operate at a deficit.<sup>25</sup>

### Has ADIPURA Made Cities Cleaner after Decentralization?

Urban environmental conditions deteriorated after the financial crisis and under the decentralized political structure. A report from the Ministry of Environment compares environmental urban conditions in cities that received the ADIPURA Award (i.e., cities that received the highest ADIPURA scores) in 1996 and 1997, and in 2003, 2004, and 2005.<sup>26</sup> It shows a significant decline in urban environmental conditions followed by a slight improvement after the restart of the program (see Table 2). In 2005, 164 out of 440 cities participated in the ADIPURA program, but less than 35 percent of those performed well in terms of urban cleanliness. This led the KLH minister to make the ADIPURA program mandatory for all cities of more than 100,000 inhabitants. The KLH report states, “to improve the implementation of the program in the future, criteria and mechanisms for monitoring and [an]evaluation process will be continuously introduced. Improvement criteria will include analysis of the relationship between physical and nonphysical criteria. The correlation between physical criteria and nonphysical is expected to be the basis for the preparation of an urban environmental management index.”<sup>27</sup>

The ADIPURA program has been occasionally in the news, including in 2010 when it was tainted by a corruption scandal. The award went to Bekasi, a city with several major industrial enterprises known to be chronic polluters, and also the Citarum River, which is a highly polluted waterway. The Corruption Eradication Commission investigated the issue, and it later emerged that Bekasi’s mayor, Mochtar Mohammad, had bribed the team carrying out the inspection for KLH. Mochtar and the officials involved were convicted and jailed.<sup>28</sup>

There has not been any serious study done of ADIPURA’s impact in thirty years. This contrasts with PROPER, KLH’s other flagship program, which has been extensively studied.<sup>29</sup> During the Suharto regime, it appears that the “shame and

<sup>25</sup> Damanhuri, “Some Principal Issues on Municipal Solid Waste Management in Indonesia,” 2–4.

<sup>26</sup> Kementerian Lingkungan Hidup, “Laporan Hasil Pemantauan dan Evaluasi Program ADIPURA Tahun ke-3 (2004–2005)” [Monitoring and Evaluation Report of the ADIPURA program, 3rd year (2004–05)], Jakarta, June 2005.

<sup>27</sup> Ibid., 25.

<sup>28</sup> <http://www.thejakartapost.com/news/2011/02/06/ADIPURA-scandal-a-slap-face-indonesia.html>, accessed November 15, 2014.

<sup>29</sup> See: Shakeb Afsah et al., *Environmental Regulation and Public Disclosure* (New York: Resources for the Future Press, 2013); García, Afsah, and Sterner, “Which Firms are More Sensitive to Public Disclosure Schemes for Pollution Control?”; Allen Blackman, Shakeb Afsah, and Damayanti Ratunanda, “How Do Public Disclosure Pollution Control Programs Work? Evidence from Indonesia,” *Human Ecology Review*

Table 2: Comparing Adipura Scores In Selected Cities before and after 2002

	1996	1997	2003	2004	2005
<b>Metropolitan Areas*</b>					
Jakarta Pusat [center]	80.31	81.00	67.37	71.62	73.77
Medan	76.33	76.04	66.59	70.05	73.64
Jakarta Selatan [south]	77.38	78.17	68.28	73.09	73.49
Semarang	81.03	81.02	66.75	69.65	72.09
<b>Large Cities*</b>					
Pekanbaru	75.18	75.46	66.81	63.75	75.76
Padang	81.03	80.69	72.43	73.02	73.82
Yogyakarta	80.43	80.37	65.68	64.07	71.73
Malang	77.51	81.01	64.24	65.58	71.29
Denpasar	76.69	76.55	72.66	69.7	71.26
Balikpapan	80.53	81.47	73.58	76.92	71.19
<b>Medium-size Cities*</b>					
Metro	79.95	79.3	58.69	72.39	73.01
Binjai	76.13	75.03	69.06	69.31	71.64
Bengkulu	76.43	77.43	62.3	65.45	71.38
Pare-pare	71.49	72.07	57.65	69.66	70.8

\* Cities are grouped according to population size: Metropolitan Areas = more than 1 million; Large Cities = 500,000 to 1 million; Medium Cities = 100,000 to 500,000.

Source: KLH, Laporan Hasil Pemantauan dan Evaluasi Program ADIPURA (June 2005).

reward” incentive system built into ADIPURA functioned well and led to improvements in cities’ environmental performance. But did it function well after 2002? Analyzing the data generated by ADIPURA inspections should demonstrate quantitatively whether and how the program was able to achieve waste-management improvements. Next I examine whether the political and institutional shift from dictatorship to decentralized democratic governance had an impact on the urban environment.

Since ADIPURA relies on detailed environmental inspections of virtually all Indonesian cities having a population of 100,000 or more, I expected that KLH would do a good job with data collection and evaluation. By analyzing KLH’s data, I should

be able to determine whether there was any causal relationship between ADIPURA scores and urban environmental improvements.<sup>30</sup>

This causal relationship is affected by the political circumstances under which the ADIPURA program operated. Under the centralized regime of President Suharto (1967–98), decisions made in Jakarta were followed by local politicians. The mayors' desire to gain advantages for themselves and for their cities, and wanting to avoid losing face to the central government and among their peers (an important element in Indonesian culture), ensured the success of the program. After ADIPURA was revived in 2002, the program functioned differently under the decentralized regime. As stated in a 2011 op-ed in the *Jakarta Post*, "the ADIPURA Clean Cities Award was once regarded as a prestigious award given to local administrations committed to keeping the environment clean. As times went by, however, the award has been losing its allure. The culprit, in this case, was the regional autonomy that has pressured local government officials to seek awards signifying their achievements. And the ADIPURA Award is one such award and at the same time a political commodity to win the hearts and minds of voters and support from the central government."<sup>31</sup> Under the new regime, which provides many opportunities for corruption, programs like ADIPURA are dependent on politicians who decide on information access and entitlements.<sup>32</sup> Environmental activists state that the award often goes to dirty and heavily polluted cities, as mentioned in the *Jakarta Post*.<sup>33</sup>

In post-Suharto Indonesia, there is evidence that corruption is more decentralized and has increased, but environmental NGOs are a political force to be reckoned with and the middle class is increasingly concerned about the environment. A Pew Global Attitude Survey found that about 30 percent of Indonesian respondents identified "pollution/environment" as the first or second greatest danger in the world today behind the "gap between rich and poor" and "religious/ethnic hatred."<sup>34</sup> A CLSA

<sup>30</sup> Disaggregated ADIPURA data should be available for the initial thirteen years (1986 to 1998) and subsequent years (2002 to 2015). KLH officials refused to give us access to the more recent disaggregated data and told us that the 1986–98 data was "lost." (It is unclear whether that means willfully destroyed, misplaced when BAPEDAL/KLH moved to new offices, poorly archived and mismanaged, or something else.)

<sup>31</sup> Budi Widianarko, "Adipura Scandal a Slap in the Face for Indonesia," <http://www.thejakartapost.com/news/2011/02/06/ADIPURA-scandal-a-slap-face-indonesia.html>, accessed November 15, 2014.

<sup>32</sup> Michael Mason, "Transparency for Whom? Information Disclosure and Power in a Global Environmental Governance," *Global Environmental Politics* 8, 2 (2008): 8–13.

<sup>33</sup> A *Jakarta Post* article dated June 7, 2005, says that environmentalists were decidedly unimpressed when ADIPURA award judges honored Central Jakarta and South Jakarta in the category of cleanest metropolis. "I am really stunned by that. I do not think they deserve an award because they are guilty of what I call the urban neglect of their residents," environmentalist Darrundono told the *Jakarta Post* (Damar Harsanto, "Jakarta Environmental Awards a Farce," *Jakarta Post*, June 7, 2005, <http://lists.topica.com/lists/indonesia-act@igc.topica.com/read/message.html?sort=&mid=811152870>, accessed November 15, 2014). The Central Jakarta municipal office on Jl. Tanah Abang I and the South Jakarta municipal office on Jl. Iskandarsyah occupied land that had been designated as green areas. In another case, a mayor who had refused to allow his city to join the program (presumably because he did not want to highlight the poor environmental condition of the city since doing so could affect his reelection chances) started to become a champion of the program once he became mayor of another city that had already received a "clean city award."

<sup>34</sup> Pew Global Attitudes Survey: "Global Unease with Major World Powers: Rising Environmental Concern in 47-Nation Survey" (2007), <http://www.pewglobal.org/2007/06/27/global-unease-with-major-world-powers/>, accessed November 15, 2014



market survey of twenty-one thousand middle-class, largely urban Indonesians indicates that the environment is identified as the third topic of “biggest concern” (79 percent of respondents), after “corruption” (81 percent) and “job security” (80 percent).<sup>35</sup> Environment ranks higher than child education (55 percent) and crime (46 percent). With a sample size of five thousand respondents in urban and rural locations, a KLH survey found that the majority of respondents consider their cities, rivers, and air to be moderately to severely polluted. Only 33 percent of respondents feel the air quality is good, 22 percent say their cities are clean and green, and 14 percent think their rivers are clean.<sup>36</sup> A study on air quality in Jakarta—which uses a combination of data on housing rental prices and characteristics from the Indonesian Family Life Survey, and data on the ambient level of six different pollutants in Jakarta—showed that, in the cases of lead, total hydro carbon (THC), and SO<sub>2</sub> (sulfur dioxide), air pollutants have a negative association with property values (e.g., housing rental price), and estimates that the per-family “cost” of unclean air in Jakarta ranges from US\$28 to US\$85 per µg/m<sup>3</sup>.

Using data for 2008–09, 2010–11, and 2012–13, I examined the relationships between ADIPURA scores<sup>37</sup> and urban indicators.<sup>38</sup> In summary, there is a clear positive correlation between the two, indicating that rich cities tend to have high ADIPURA scores, cities with low poverty rates receive high scores, and that cities with large populations fare better than small cities (although medium-size cities do better than metropolises). Both total public expenditures and public expenditures on environment-related projects are positively correlated with ADIPURA scores.

To explore further the relationships between scores and socio-economic indicators, I estimate simple ordinary least squares (OLS) regressions of average city-level ADIPURA scores on socio-economic variables, using the 2011 cross-section data for a sample of 309 cities,<sup>39</sup> which has the best coverage.<sup>40</sup> The results indicate that

<sup>35</sup> “Mr. and Mrs. Indonesia,” 2007 commercial market survey of twenty-one thousand (middle class) respondents in twenty big Indonesian cities, by Crédit Lyonnais Securities Asia (CLSA) Indonesia (Roy Morgan), quoted in: World Bank, “Investing in a More Sustainable Indonesia,” 39.

<sup>36</sup> World Bank, “Investing in a More Sustainable Indonesia.”

<sup>37</sup> KLH refused to share with me the disaggregated data. I suspect that the reason for this refusal is that the data have been tampered with and cannot be trusted. Nevertheless, I managed to obtain some of this data from sources external to KLH. In this paper I compare ADIPURA results for 2008–09, 2010–11, and 2012–13. My sample consists of 57,000 observations for 159 cities for 2004–05 and 530,000 observations for four additional years, as follows:

2008–09 71 medium and small cities

2010–11 377 cities, of which 26 are metropolitan and large and 351 are medium and small

2011–12 28 metropolitan and large cities

2012–13 130 cities, of which 19 are metropolitan and large and 111 are medium and small

I did not make much use of the ADIPURA data for 2004–05 because they are not comparable with data for later years, or of the 2011–12 data, because I do not have corresponding disaggregated data in my urban dataset. Details about my dataset are available upon request.

<sup>38</sup> I also use a large dataset with annual data for each *kota/kabupaten* on economic (e.g., GDP growth), fiscal (e.g., taxes and public expenditures), infrastructure (e.g., telephone access, electricity, water and sanitation, roads), and socio-demographic (e.g., education, health, poverty) variables.

<sup>39</sup> The 2009 and 2012 samples are much smaller than the 2011 one and probably subject to sample selection bias ( $N = 1,083$  for 2009 and  $N = 1,158$  for 2012, compared to  $N = 5,881$  for 2011).

<sup>40</sup> I estimate the structural model (1)  $S_i = \alpha + \beta \cdot X_i + \gamma \cdot Z_i + v_i$ , where  $i$  indexes cities,  $S$  is the ADIPURA score,  $X$  a set of characteristics (including city-level GDP, literacy, poverty rate, population size), and  $Z$  a

ADIPURA scores are high in large, wealthy communities as measured by their access to electricity and water. More-populated cities also display higher scores relative to less-populated cities and towns. A high level of expenditures on environmental programs and projects is also positively correlated with the score received (although this is only significant at the 10 percent level). Medium-size cities have marginally higher scores than do metropolitan cities. While these results are intuitive, they are only correlations since the cross-section setting does not control for city-level, unobserved effects. Therefore, I collapse the data at a less aggregated level, which is to say within each city, for the sixteen different areas that are scored.<sup>41</sup> This results in a panel with 10,273 observations. Because I have several observations per city, it allows me to control for overall city-level effects.<sup>42</sup> The results show that access to municipal electricity and water services correlates with high scores. In general, large cities have high scores, although compared to large and metropolitan cities, small and medium-size cities have higher average scores. In terms of expenditures, environmental spending has a positive impact, while the effect of total spending is generally negative.<sup>43</sup>

I also perform panel fixed effect estimations, using the subsample of cities for which scores are available for the three years 2009, 2011, and 2012. Although this might still be a biased sample, the inclusion of city-level fixed effects provides some additional robustness to the results.<sup>44</sup> The outcome is broadly in line with expectations and previous findings. Electricity and water access are still positively and significantly correlated, meaning that ADIPURA scores improved in those cities that expanded their water and electricity services. On the other hand, the coefficient for sanitation is negative and significant, which indicates that scores decreased where sanitation services improved. One possible interpretation is that local governments face tradeoff issues across different policy areas, although more evidence would be needed on this. In terms of fiscal variables, an increase in the special allocation grant

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set of policy or fiscal variables (including total expenditure, environment expenditure, total natural resource revenue sharing, and total specific allocation grant for environment). Details about the econometric model are available from the author upon request.

<sup>41</sup> Physical inspections of how waste is managed take place in settlements (houses), roads, markets, shopping centers, public buildings, schools, hospitals and health centers, urban forests and city parks, transportation facilities (bus terminals, railway stations, ports, and airports); open water (rivers, lakes, and canals), and waste-management facilities (landfills, garbage banks, and waste-treatment facilities).

<sup>42</sup> I estimate (2)  $S_{ki} = a + \beta.X_{ki} + \gamma.Z_{ki} + \theta_i + v_{ki}$ , where  $k$  indexes scoring places within cities, such as urban forests, roads, landfills, and open water. This specification allows one to control for the overall city level effect, with the inclusion of the fixed effect  $\theta_i$ .

<sup>43</sup> The size of the city (metropolitan, large, medium, or small) is represented by a dummy in the regression. For infrastructure, Lewis states that local governments that invest heavily in public infrastructure are better able to cope with the detrimental effects of rapid urbanization on economic growth than are municipalities without such investments (see Lewis, "Urbanization and Economic Growth in Indonesia," 192–207). In fact, at some level of infrastructure investment, the negative impact of urban population growth can be overcome. Unfortunately, the evidence suggests that only about 20 percent of local governments spend enough on infrastructure in this regard; see E. Skoufias, A. Narayan, B. Dasgupta, and K. Kaiser, "Electoral Accountability and Local Government Spending in Indonesia," The World Bank, Policy Research Working Paper No. 6782 (2014).

<sup>44</sup> I estimate (3)  $S_{kit} = a + \beta.X_{kit} + \gamma.Z_{kit} + \theta_{ki} + v_{kit}$ , where  $t$  indexes time, and  $\theta_{ki}$  is now a city-crossed-with fixed effect.



appears to have a positive and significant impact on city scores.<sup>45</sup> Finally, I ran the same panel at the location level (e.g., schools, bus terminals, parks, landfills), exploiting the panel by restricting the set of observations to the topics for which there is enough coverage.<sup>46</sup> The results give an indication of which specific topics improved in connection with changes in the characteristics on which ADIPURA focuses. Locations with the best electricity coverage score well on the measure of having clean urban parks; those with good municipal water services get high scores on landfills and cleanliness of bus terminals. Finally, in terms of fiscal spending, an increase in the special allocation grant leads to better scores for urban forests, roads, markets, hospitals, landfills, and urban parks, while it decreases that of bus terminals.

### ADIPURA's Legacy and Future

In many respects, the positive environmental achievements of Suharto's New Order, including ADIPURA, were a direct consequence of its authoritarian structure. Under Suharto, purely environmental considerations never played a major role, but environmental protections were implemented because they were part of the broader political agenda. With the collapse of the authoritarian New Order, the political context for sustained environmental protection disappeared.<sup>47</sup> After Suharto's fall in 1998, environmental issues failed to recover a significant place on the political agenda. As a result, anti-pollution laws were weakly implemented.

The ADIPURA program is now thirty years old. Its durability is a sign that it has political appeal, but it is plagued by four issues. First, under a decentralized democratic system, the program's incentive system is inadequate. Under Suharto, the award was given by the president to the mayor, and it was implicitly assumed that the mayor would be reappointed by Suharto. Today, since mayors are elected, it is not clear what incentive mechanisms are at work to benefit ADIPURA. Second, the Ministry of Environment, which administers the program, has a credibility issue. The head of the Ministry of Environment is a political appointee and, because of several recent corruption scandals, the credibility of the ministry has collapsed. Third, the ADIPURA program has become complex and its objectives are not well understood, and it is not coordinated with Indonesia's new legislation on waste management. In 2011, the Ministry of Environment added air and water quality to the program, stating that air and water quality levels in that year would be used as the baseline for the awards in 2012. However, 75 percent of the overall ADIPURA score was based on

<sup>45</sup> The intergovernmental specific-purpose grant (DAK) is the most important mechanism to stimulate local government infrastructure investment. But funding for DAK has stagnated at relatively low levels. While DAK funding rose significantly between 2003 and 2007, it did not increase in real terms during the following five years, despite an official policy agenda to the contrary. Moreover, the portion of the grant devoted to infrastructure has declined considerably over the years. In 2003, distributions for infrastructure were over 50 percent of all DAK distributions; by 2012, less than 25 percent of all DAK distributions were allocated to traditional infrastructure sub-sectors. See Skoufias et al., "Electoral Accountability and Local Government Spending in Indonesia."

<sup>46</sup> Focusing on each scoring place within city ("k") at a time, this brings the panel back to a city-level one:  $(4) S_{it} = \alpha + \beta \cdot X_{it} + \gamma \cdot Z_{it} + \theta_i + v_{it}$

<sup>47</sup> Robert Cribb, "Environmentalism in Indonesian Politics," in *Towards Integrated Environmental Law in Indonesia*, ed. Adriaan Bedner and Nicole Niessen (Leiden: Research School CNWS, University of Leiden, 2003), 37–48.

waste management, and only 10 percent on air-pollution and 15 percent on water-pollution control measures.<sup>48</sup> Finally, the program seemingly is a waste of public funds, given its results. Figures for ADIPURA's budget are not available, but the program's costs could easily exceed \$41 million, or IDR 500 billion per year. This is a high price for a program whose achievements in the post-Suharto era are uncertain.

This study has tried to measure some of those achievements. My results are preliminary, however, because KLH has refused to share the disaggregated data with me. Using the limited sample that I was able to obtain from external sources, I find that the "cleaner" cities, as measured by ADIPURA scores, are those that are most populated and provide electricity and municipal water to a large percentage of their citizens. ADIPURA scores improved in cities that increased their population's access to water and electricity services. In terms of fiscal variables, increase in the special allocation grant appears to have a positive and significant impact on city scores. Locations with widespread electric service appear also to have urban parks; those offering municipal water services to much of the population get good scores for landfills. An increase in the special allocation grant is positively correlated with high scores for roads, markets, hospitals, landfills, park, and urban forests. If I had had access to the complete dataset of ADIPURA scores, I would have been able, through econometric work, to get a much more thorough understanding of how this program has contributed to environmental improvements in cities.

ADIPURA is, potentially, a useful tool to clean up cities, but the program needs to be overhauled, coordinated with other government policies, and transformed to overcome and prevent further corruption and manipulation. As Afsah and Makarim put it, Indonesia needs "environmental management 3.0."<sup>49</sup> The inspections should be done by neutral parties; the scoring system should be revised to avoid subjective appreciations; and the scores should be entered into foolproof software that aggregates scores automatically, and which makes manipulation by public officials impossible. To ensure transparency, all data should instantaneously appear on a website that is publicly available. If the new ADIPURA program is expected to measure not only waste management, but also air and water quality, it must be radically modified. It does not make sense to add water and air quality to the target goals, but then give them only minimal weight, as is the case at present. The reward system should be transformed into a reward and penalty system, and linked to transfers from the Special Allocation Grant or General Allocation Grant. *Kota* and *kabupaten* that perform well should receive a bonus allocation, and those that perform poorly should be penalized. Because ADIPURA inspections are expensive and administrative costs are high, the program's shortcomings are worrisome. The program's expenditures might be justified if the results can be shown to be linked to the subsidies (grants) received by *kota* and *kabupaten*, and if the risks of data

<sup>48</sup> In my opinion, expanding ADIPURA to include water and air quality was a mistake. The success of a disclosure program depends on its simplicity, and targets must be compatible with the authority of the person in charge. The new ADIPURA program contains too many targets, and mayors are in charge of waste management but not of water quality and air quality.

<sup>49</sup> Shakeb Afsah and Nabel Makarim, "Environmental Management 3.0: Connecting the Dots between Pollution, Sustainability, Transparency and Governance in Indonesia," in *Environmental Policies in Asia—Perspectives from Seven Asian Countries*, ed. Jing Huang and Shreekanth Gupta (Singapore: World Scientific Publishing, 2014).

manipulation and political corruption are eliminated (which would require more objective inspections and better software than what's common today). In this way, ADIPURA would truly be a monitoring and control instrument and serve the national environmental policy to improve urban welfare.