

LAW, GOVERNANCE,  
AND DEVELOPMENT  
RESEARCH &  
POLICY NOTES

# POLLUTION REGULATION IN DEVELOPMENT

System Design, Compliance,  
and Enforcement

BENJAMIN VAN ROOIJ

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## Pollution Regulation in Development

## Law, Governance, and Development

Over a short period of time, the strengthening of law and governance has become a major focus for international development organisations, as well as for governments and organisations at the national level. These are now devoting a substantial portion of development funds into reform and capacity building programmes aimed at legal and administrative institutions in transitional and developing countries.

However, the building of legal and governance systems is proving to be a dauntingly difficult and complex task and one in which the methods of approach are highly contested. It has been assumed that law and governance reform is a technical, managerial and financial matter, which allows for the export of laws and the transplantation of legal and administrative structures. The disappointing results of such reforms have illustrated, however, that not enough attention has been given to how laws, policies, institutions and stakeholders operate in reality, in their socio-political contexts. The uniqueness of individual countries, sectors and institutions is often insufficiently understood, and the actual experiences with the myriad of law and governance programmes and projects are not translated into knowledge on how law and governance reform promotes development.

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# **Pollution Regulation in Development**

System Design, Compliance, and Enforcement

*Benjamin van Rooij*

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For further information please contact: Van Vollenhoven Institute, Leiden University: [vollenhoven@law.leidenuniv.nl](mailto:vollenhoven@law.leidenuniv.nl).

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## **Pollution in Industrializing Economies, a Challenge for Regulation**

Over the last decades, some non-OECD countries such as Brazil, Indonesia, Colombia, Mexico, India and China have been rapidly industrializing. While this has had positive effects on economic growth, it has also caused pollution with severe effects on the natural environment, human health, and global climate change. China is a good example. Since 1978, industrialisation has brought impressive economic growth but with tremendous negative effects on the national and international environment. China has over the last decade become one of the world's largest polluters, and has sixteen of the world's twenty most polluted cities, and since 2006, is the world's largest emitter of greenhouse gases, which have a large influence on global climate change. According to recent estimates, Chinese pollution causes 750,000 premature deaths annually. Some 300 million Chinese drink contaminated water on a daily basis, and of these, 190 million suffer from related illnesses (OECD 2007; World Bank 2007; MNP 2007; Economy 2007).

In response to the new pollution threat, most of the industrializing economies have installed pollution prevention and control regulations, and implementing institutions. In practice, however, the regulations often fail to achieve the desired results. Violations of the law remain pervasive, and enforcement reactions against violations of the law are often ineffective.

This Research and Policy Note will explain why the regulation of pollution in these countries is so difficult. It will do so by looking at several aspects of pollution regulation frameworks. In doing so, it will discuss the following issues:

*“In response to the new pollution threat, most of the industrializing economies have installed pollution prevention and control regulations, and implementing institutions. In practice, however, the regulations often fail to achieve the desired results.”*

- What are the various systems that are available to regulate pollution?
- Why do some companies comply with the law, even when this incurs considerable costs?;
- What obstacles exist when organizing effective law enforcement in industrializing economies?;
- What are the most effective enforcement strategies in creating compliance in industrializing economies?;
- How can local communities compel polluting companies to pollute less and comply with existing laws?;
- To what extent do market forces influence pollution compliance in industrializing economies?;
- What political conditions are necessary to enable effective state enforcement and community pressures on polluting firms in industrializing economies?;
- What alternatives exist to direct regulation and what are their prerequisites, and what are their advantages and disadvantages when compared to direct regulation?

### **System Design: Direct Pollution Regulation**

Regulation generally indicates a deliberate system designed to control the conduct of those to whom it applies. Pollution regulation is thus a system set up to prevent and control pollution. A common distinction is that between *traditional direct regulation* (often called “command and control” regulation), and *indirect alternative forms of regulation*.

Direct regulation is a system of legal norms that prescribe or forbid certain behaviour, that are implemented through enforcement action against those who fail to comply with these norms. Direct regulation includes environmental standards that set a certain target for industry to attain, and permits and licenses that allow enterprises to discharge a certain level of pollution or they may prescribe a certain abatement measure in relation to the regulated industry or firm.

In most industrializing countries, direct regulation forms the core of the pollution regulation system. At the same time various countries have incorporated elements of alternative indirect systems involving market regulation and self-regulation. Examples include the discharge fee system in China, Colombia and the Philippines, the public disclosure system in Indonesia, Brazil, and Mexico, and the certification and environmental management systems in China and Mexico. These alternatives will be discussed further in the final section before the conclusion of this policy brief.

*“It is generally believed that firms are more likely to comply with the law if they are: richer, larger, privately owned, make good profits, have pro-environment and law-abiding management with a long-term view regarding costs and benefits and with an established internal environmental management systems.”*

### **Compliance and Enterprise Characteristics**

Compliance is a central objective of direct pollution regulation. Regulated firms are forced to reduce their pollution by enforcing compliance with the legal norms. An essential question in the design of pollution regulations is what causes industrial enterprises to comply with laws that demand them to pollute less, often at considerable costs.

Some enterprises are more likely to comply with pollution regulations than others. Influential factors include:

- the size of the enterprise;
- its profitability;
- its management capacity;
- the ethical and environmental values of its managers;
- and the type of ownership.

It is generally believed that firms are more likely to comply with the law if they are: richer, larger, privately owned, make good profits, have pro-environment and law-abiding management with a long-term view regarding costs and benefits and with an established internal environmental management systems. There is, however, still some debate about specific factors, especially the size of the enterprises.

#### **Box 1: Size Matters, But How?**

Some scholars believe that larger organisations are more capable of complying with the law because they have more resources, which allows for investment in compliance and training specialized compliance personnel. Moreover, larger organisations are more motivated to comply with the law to protect their reputations. In contrast, several studies have demonstrated that larger organisations can use their resources and power to postpone compliance or hide violations or protect themselves against enforcement efforts. Large enterprises that





are dominant employers – meaning that they are responsible for a significant amount of income in a given area – have a particularly large amount of power when confronted with local law enforcement agents or local communities, thus making it easier for them to violate the law. Larger size also has a negative influence on compliance since larger organisations have less control over internal information flows and over the individual conduct of employees.

Sources: Huisman 2001; Kagan and Scholz 1984; DiMento 1989; Dasgupta et al. 2000; Vaughan 1983; Punch 1996; Arts 1998.

Pollution regulation efforts in industrializing countries are more difficult because of the characteristics of local enterprises and their management. There may be:

- Many smaller enterprises;
- Enterprises functioning with minimal profit margins;
- Enterprises unable to invest in and operate pollution abatement equipment;
- Informal enterprises – i.e., unregistered and not paying taxes – are less inclined to abide by the law in the first place;
- Older state-owned enterprises with outdated equipment and profitability options;
- A low level of legal and environmental awareness among enterprise management;
- Enterprises that are dominant local employers in the newly industrializing transition context, who are able to use their power to receive beneficial treatment from regulators and local communities. (See Box 1).

*“Compliance often requires more than just pressure from the state through law enforcement. Ideally, a convergence of four elements exists: state law enforcement, social pressures, market forces, and political conditions. The idea of convergence means that the different external pressures can work in a mutually reinforcing manner.”*

### **Compliance and External Pressures**

In most cases, compliance requires the application of external pressures on the regulated enterprise. The best known form of pressure is

state law enforcement, which punishes enterprises that violate pollution regulations. However, compliance often requires more than just pressure from the state through law enforcement. Ideally, a convergence of four elements exists: state law enforcement, social pressures, market forces, and political conditions. The idea of convergence means that the different external pressures can work in a mutually reinforcing manner. For an example of how this has worked in OECD countries see box 2.

### **Box 2: Regulatory Convergence in the West**

Paper mills in the US, Canada, Australia, and New Zealand have invested significantly in abatement, at considerable cost, in order to meet the increasingly stringent environmental standards. They did so as a result of stricter environmental legislation, which was followed by a threat of state enforcement actions, class action litigation by citizens and advocacy groups, and pressures from negative publicity and shaming. Once a large number of paper mills had given in to this new pressure and they began complying with the new regulations, the market for paper adapted to the new conditions and the price of paper rose to incorporate the extra costs of cleaner paper production. This made it easier for the complying enterprises to maintain their compliance and for continued violators to begin producing paper in compliance with the law.

Source: Gunningham et al. 2003.

Regulatory convergence may have precisely the opposite effect in developing industrializing settings where market forces and political conditions undermine state enforcement and community or group action. Whereas in Western countries compliance became the norm and compliance related costs were passed along in market prices, in newly industrializing countries, non-compliance may sometimes still be the norm and competitive markets do not fully represent compliance costs, causing complying firms to price themselves out of the market.

The question is how such a positive regulatory convergence can be established and a negative convergence averted under conditions of developing industrialisation. Understanding this will require further investigation regarding the conditions under which the different external pressures on regulated firms operate, as will be discussed in the following sections.

*“Whereas in Western countries compliance became the norm and compliance related costs were passed along in market prices, in newly industrializing countries, non-compliance may sometimes still be the norm and competitive markets do not fully represent compliance costs, causing complying firms to price themselves out of the market.”*

### **Organizing Enforcement**

Enforcement is the state’s reaction to law violations in order to stop present violations and prevent violations in the future. In its essence enforcement is thus about attaining compliance. Effective and efficient enforcement influences the compliance of firms to comply with the law at the lowest costs for the enforcement agencies and the regulated actors involved, as well as the society at large. Pollution law enforcement generally concerns two aspects: detecting violations of law (detection), and deciding on and executing the appropriate response (sanction application).

Organizing effective and efficient law enforcement is very difficult, especially in a developmental context. There are several core challenges that undermine state pollution enforcement in practice:

- Lack of financial, human and technical resources, which undermines the agency’s ability to pro-actively monitor compliance, detect violations, and prepare, issue and execute sanctions;
- Goal displacement: making procedures or sufficient funding more important than effective pollution enforcement;
- Weak staff management procedures that hinder the enforcement agency’s ability to control and compel its agents to enforce effectively when out in the field;
- Favouritism, collusion and corruption (for an example, see box 3).

*“In industrializing economies, organizing effective and efficient law enforcement becomes extremely challenging, because there are many potential violations at a multitude of smaller enterprises, plus financial, human, and technical resources are often lacking, agency-agent overview procedures are likely underdeveloped and there may be value systems closely related to favouritism.”*

### Box 3: Cultural Values, Favouritism and Pollution Enforcement in the Philippines

Oposa's study of environmental law enforcement in the Philippines provides a good description of how certain values can influence favouritism and corruption and undermine enforcement. He describes how a low-level, low-paid enforcement agent inspects a factory. The agent is received by a well-educated manager who, according to Filipino values, commands a certain amount of *pagagalang* (respect). The two make "personal connections" by exchanging small talk about where they are from and how they are doing. Following the detection of a violation, the director "requests" a break and to just forget the infraction in the name of *pakiksama* (preserving good relations). If the agent chooses to concur, then *utang na loob* (debt of gratitude) is created, which is a form of social capital that the agent now has vis-à-vis the factory manager, which can be "cashed" at any time in the future. Similarly, this type of favour-seeking behaviour may be used indirectly through a third person, such as a local politician who the manager knows personally and who can use his political clout to coerce the agent to grant a favour by "going easy" during his inspection.

Source: Oposa 1998.

There are methods for dealing with enforcement challenges:

- Invest in or lobby for more resources for pollution enforcement;
- Establish an enforcement priority system to use the available resources as effectively and efficiently as possible (see box 4);
- Involve the public in exposing violations;
- Make use of ICT systems such as continuous environmental monitoring systems to aid in the monitoring of compliance;
- Install outcome (in terms of compliance and pollution reduction) enforcement performance monitoring systems and refrain from using output (numbers of inspections and sanctions) enforcement monitoring systems;<sup>1</sup>
- Reduce unnecessary procedures related to pollution enforcement;
- Establish reward structures with good salaries that will induce agents to carry out effective and efficient law enforcement
- Establish effective procedures to deal with agents who perform sub-standard;
- Hire staff with a firm commitment to environmental protection and sustain and build their "sense of mission" through training, peer pressure, and through the installation of inspirational leadership;
- Limit agent discretion;

- Team agents up when in the field so that they can check one another;
- Divide decision-making responsibilities over several levels in the enforcement agency;
- Establish clear rules about agent-enterprise relations in codes of conduct.

#### **Box 4: Prioritisation of Enforcement**

FEEMA, Rio de Janeiro's environmental authority, has sought new ways to improve its monitoring and enforcement capacities. Originally, FEEMA was a weak environmental protection agency, typical of developing countries. It lacked political support, resources and a proper management structure. In the 1990s, FEEMA developed a system of targeted enforcement in which polluters were assigned a letter (A, B or C) according to the level of their pollution. The categories were based on extensive research which found that 60% of all local pollution could be controlled by controlling only 50 type-A factories, while another 20% of the pollution was attributable to 150 type-B plants. The other thousands of type-C plants amounted to only 20% of the total pollution. This prioritisation strategy allowed the enforcement agency to use its scarce administrative resources fully on the most polluting firms.

The World Bank sees this not only as a way of dealing with scarce enforcement resources but also as a flexible method of law enforcement that allows regulators to focus enforcement work on larger plants for whom pollution abatement will be more cost efficient. The prioritisation of law enforcement work is an important tool to improve the impact of weak law enforcers in developing countries. It can also work for indirect pollution regulation. Some of the successes with discharge fees, public disclosure and environmental management systems in Colombia, the Philippines, Indonesia, China and Mexico can be attributed to a more targeted approach to regulation.

Source: World Bank 2000.

### **Enforcement Strategies/Styles**

An important question in pollution enforcement policy is what style or strategy enforcement agents use to compel regulated firms to comply with the law. There are in general two main styles that can be discerned: a style based on *deterrence* and one on *co-operation*.

*Deterrence pollution enforcement* is based on the idea that regulated enterprises make a rational calculation of the costs and benefits of compliance and violation. It holds that to transform violation into compliance the regulated enterprise's costs of violation should be made higher than the costs of compliance.<sup>2</sup> The expected violation costs are related to the violation detection rate and the level of expected sanctions. Because it is difficult and expensive to raise the detection rate, deterrent law enforcement often makes use of relatively strict sanctions. Deterrence-style enforcement is also formal, meaning that enforcement agents go strictly by the book, without looking at the special circumstances of the violator in question. Thus, deterrence has been typified by the fact that it places regulators in an adversarial position with regard to the regulated actor. There are several drawbacks to deterrent law enforcement:

- enterprises may be unable to make a rational calculation of expected costs and benefits, and thus may not react to deterrent enforcement;
- a deterrent approach requiring a higher detection rate may prove to be too costly;
- the enterprise may find deterrent enforcement unreasonable, leading to enterprise resistance;
- agents may be unwilling to enter into an adversarial relationship with regulated enterprises;
- an overly legalistic adherence to the law by going by the book is not flexible enough to deal with complex reality and may thus not lead to sustained compliance.

*“Agents should start with a co-operative attitude trying to understand the regulated enterprise and persuade and educate him into compliance. Only if that fails and when the trust between agency and regulated enterprise has been breached should a more deterrent punitive approach be used.”*

In contrast with deterrence, the *co-operation enforcement* style is based on the idea that in order to get sustained compliance, the agent and the regulated actor should understand each other and work together towards compliance. Co-operation enforcement agents make the law's goals central, not its rules. The main goal is achieving sustained compliance and a reduction of pollution. For this, agent-enterprise co-operation and mutual understanding are deemed crucial. Punishment is not the preferred method, instead, agents should employ persuasion

and education, and only if these fail are they to resort to penalties. Co-operation enforcement only succeeds if enforcement agents and agencies have considerable discretion. Such discretion is necessary to find workable solutions for sustainable compliance, in which the circumstances of the regulated actor play an important role. The biggest problem with the co-operative style is that it can easily lead to enforcement agents having too much understanding for the circumstances at the regulated enterprise and thus leading to lax enforcement and sub-optimum compliance. As such there is a danger of collusion when the enforcement agency gets captured by industry interests.

Nowadays most scholars agree that the best enforcement strategy is a *combination of deterrence and co-operation*. Agents should start with a co-operative attitude trying to understand the regulated enterprise and persuade and educate him into compliance. Only if that fails and when the trust between agency and regulated enterprise has been breached should a more deterrent punitive approach be used. This means that stricter sanctions should be reserved only for the worst cases. The so-called enforcement pyramid is a graphic portrayal of such a mixed strategy, showing how ideally enforcement should move up the pyramid from co-operative to deterrent, using more of the former and less of the latter. See box 5.

#### Box 5: The Enforcement Pyramid



Source: Ayres and Braithwaite 1992.

*“It is essential that more thought is given to developing the right enforcement strategy that fits both the local pollution situation as well as the regulatory context at hand. To do so, an overstated dichotomy between deterrence and compliance should be prevented.”*

In pollution law enforcement studies of industrializing economies there has been less preference for mixed enforcement styles. Some scholars have advocated stronger deterrence type enforcement with limited agent discretion to prevent corruption, while other scholars have argued for a more co-operative style, with more informal, non-state law enforcement practices. As an example of the latter, the World Bank sponsored pollution enforcement studies in developing industrializing countries, which advocate a new compliance type model of enforcement in which the environmental agency “becomes more like a mediator and less like a dictator” (World Bank 2000). In the World Bank view, regulators then function through facilitating how social organisations, consumers, bankers and stockholders negotiate with the regulated actor to achieve compliance and better environmental performance.

It is essential that more thought is given to developing the right enforcement strategy that fits both the local pollution situation as well as the regulatory context at hand. To do so, an overstated dichotomy between deterrence and compliance should be prevented. Instead enforcement policy makers and executors should look at what combination of approaches in terms of stringency, level of co-operation and the level of agent discretion fit best within their working environment. Such working environment includes the available financial, human, and technical enforcement resources, enforcement agency leadership, the functioning of procedures to monitor the enforcement outputs and outcomes, the type of violator and violation and the level and type of pressure from the society and politicians on enforcement work. Here a system of prioritisation should be combined with an operationalized enforcement pyramid, in order to create effective working procedures to prioritize detection work and decide on appropriate sanctions for violations found.

### **Pressures from Society**

Pressures from local communities and environmental NGOs also play an important role in improving industrial compliance with pollution



regulation. They do so either by asserting direct pressure on the enterprise, or indirectly through their influence on state law enforcement authorities.

Pressures from social groups can force regulated enterprises to comply with the law, even when state law enforcement is weak. Collective action by local communities and NGOs, especially when working together with the media, can be very effective to make regulated actors comply with the law. There are many examples in countries as diverse as Bangladesh, China, Indonesia, and Brazil. Violations that result in calamities, such as big pollution spills, play an important role in initiating social pressure, and once initiated, these accidents may be used to exert extra pressure. A dramatic pollution incident in Brazil in 1984, led to a “surge of social mobilisation against pollution” for example (Carmen de Mello Lemos 1998). In Indonesia, similar accidents such as the pollution reservoir leakage in 1988 and a boiler explosion in 1993. Both of these accidents occurred at the Indorayon paper mill and helped NGOs create more effective pressure on governments to end violations (Sonnenveld 1998).

*“Pressures from social groups can force regulated enterprises to comply with the law, even when state law enforcement is weak. Collective action by local communities and NGOs, especially when working together with the media, can be very effective to make regulated actors comply with the law.”*

Local communities directly affected by these kinds of incidents, or non-governmental agencies (NGOs), may also indirectly influence industry compliance through the shaping of law enforcement. One way they do this is by helping those directly affected file complaints to enforcement authorities. With more and better complaints filed the detection of violations becomes easier and less costly. Moreover, the more complaints filed the more serious each violation is taken. Social groups also influence law enforcement by using legal and political means to demand stricter pollution enforcement. In industrialising developmental settings, strong NGO-organized social action, sometimes even involving public interest litigation has had some success in improving law enforcement.

Social pressures aimed at controlling pollution are an important impetus for compliance, while a lack of these pressures undermines law enforcement and makes non-compliance easier. Local community pressure does not always occur, however. See box 6 for an illustration in China.

**Box 6: A Tale of Two Factories: Community Pollution Regulation in China**

In Huafei, in Southwest China – a large, privately-owned chemical fertiliser factory – has been secretly switching off its pollution control installations at night to increase its profits. Huafei's chemical discharges, which went unnoticed for a long time by local environmental authorities, had a significant impact on the local villagers whose rice was polluted and whose water buffaloes got so sick that they could no longer be used to work in the rice paddies. Although the villagers suffered severe damage and ill health, they did not confront the company. Meanwhile, Ningshi Fertiliser, another chemical fertiliser factory, is located some 50 kilometres to the north, has been consistently pressured by the local villagers regarding its pollution violations. Over the past few years, the villagers have consistently called the local Environmental Protection Agency and the media whenever they suspected the factory was illegally discharging its waste, even sometimes when they were not. Furthermore, these farmers broke the factory's discharge pipes to flood their own lands with the factory's wastewater in order to increase compensation demands. This kind of pressure forced Ningshi to invest in complying with regulations, and, unlike Huafei, this prevented it from secretly discharging their waste at night because any discharge would have been immediately detected by the watchful eyes of the local communities.

The main difference between the cases is that the local community in Ningshi is part of a heterogeneous urbanized economy with multiple sources of income besides the Ningshi factory, while the villagers in Huafei remain a rural community where the factory is the sole non-agricultural source of income and, ironically enough, is now the main consumer of the villagers' polluted agricultural products which have become difficult to sell at the regular outside markets.

Source: Van Rooij 2006.

Community pressure only occurs if communities have sufficient:

- Independence from regulated enterprises, which is more likely when such enterprises are not dominant employers;
- Trustworthy information about the polluting activities;
- Awareness about the effects of violations on their own interests and a legal awareness of their rights and the enterprise's duties;
- Freedom to organize themselves;
- Income levels;
- Educational levels;

- Access to judicial and enforcement institutions;
- Agreement on the environmental interests protected in the law.

Again, this list poses some problems for industrializing economies, where most of the above factors are less likely to exist. This should temper our expectations about the role that local communities can play in pollution regulation, especially when no efforts are being made to support them.

To stimulate social pressure on the involved industries or on law enforcement officials, the aforementioned obstacles need to be addressed. This can be done through the establishment or amelioration of:

- Alternative sources of income for local communities not related to polluting firms;
- Public disclosure and information systems that provide citizens with trustworthy information about local pollution conditions and the performance of local enterprises;
- Environmental health education;
- Legal education and awareness;
- Environmental legal aid; and
- Political rights such as freedom of the press, association, information, and assembly.

## **Market Forces**

Market forces have an important impact on compliance as they affect the regulated enterprise, but also local communities and law enforcement authorities. Market forces affect enterprises directly because they:

- Shape the costs and benefits of violation. The market may create a demand for illegal products, making violation profitable. Conversely, lack of demand can make violation non-profitable and compliance the preferred option;
- Direct the costs of compliance. Pollution law compliance, for example, depends largely on the costs of abatement, which are influenced by the market;
- Influence the ways that regulated enterprises view the costs and benefits. Enterprises whose products do well on the market may be able to adopt a long-term perspective to such cost benefit analyses. Those businesses operating on the fringes of the market, may need to cut their costs as much as possible, and as such, operate on a day-to-day basis, as they fight for survival;
- Can provide enterprises with local power when they are one of the main employers of the local labour supply (dominant employers).

Market forces also influence local communities and law enforcement authorities, as both will be less inclined to act against dominant employers who wield considerable economic power. If unemployment looms and jobs are on the line and tax income is at stake, community and enforcement pressure may easily dissipate, especially in the newly industrializing countries.

Some options available to local communities to change market forces so that they benefit from compliance with pollution regulation include:

- Subsidizing abatement equipment or products made with less pollution;
- Taxing products whose manufacture causes pollution;
- Educating firms about the economic benefits of energy-saving and pollution-preventing production reforms;
- Investing in and otherwise stimulating non-polluting sources of income that help to diversify the local economy.

Sustainable changes in market forces that will foster compliance are difficult to make. Markets are not easily changed and there may be unexpected effects.

### **Political Conditions**

Political conditions determine the manner in which law enforcement, social pressures, and market forces can influence compliance. Understanding pollution regulation and seeking ways to improve it thus requires a thorough understanding of the various power relations and political structures that exist.

The first question is whether there is sufficient leadership commitment to pollution prevention and control. Law enforcement will be particularly more difficult without such support, as politicians decide on enforcement budgets. Similarly, it is then less likely that pollution enforcement authorities will receive the necessary co-operation from other governmental agencies that may be able to help enforce the law. For examples, see box 7.

*“Understanding pollution regulation and seeking ways to improve it thus requires a thorough understanding of the various power relations and political structures that exist.”*

A second question is to what extent those in power allow citizens to exercise political freedoms such as the freedom of association, press, representation and information. Undoubtedly, citizens and citizen orga-

nisations can only fully act in their capacity as compliance watchdogs if, via elections, they are allowed a certain level of participation, organisation and freedom to operate and influence those governments charged with enforcing the law.

A third question is to what extent local elites are present who are powerful enough to resist regulatory pressures from the state, society and the market. These local elites are more likely to exist in a system with:

- limited public participation and political rights;
- with close state-industry relationships such as in planned or transitional economies;
- homogenous local economies with limited employment opportunities and a limited number of dominant local employers; and
- in systems with decentralized governance settings, which mandate law enforcement authorities to local bureaucracies which are more likely to have closer ties with local industries and local power-brokers.

These local elites should be confronted by enhancing political freedoms, diversifying local economies, and strengthening the non-local overview of local law enforcement.

### **Alternatives to Direct Regulation**

The above scenario makes it clear that direct pollution regulation in newly industrializing countries is challenging. It is generally difficult to create sufficient pressure through enforcement, society and market forces to compel polluting enterprises to comply with the law. Critics have argued that the approach of direct regulation, which, at its core, means the use of pressure against those who break certain laws to force them to comply with the laws, is flawed. They argue that direct regulation is not efficient because its norms often lack the flexibility that would allow regulated enterprises to decide on how they might control pollution. In addition, critics believe that direct regulation is difficult to implement especially in developmental industrializing settings, where the state often lacks enforcement capacity. Such critics argue for installing modern alternative approaches to pollution regulation, which have been developed in OECD countries and offer more flexibility and less state involvement. For an overview, see box 7.

**Box 7: Alternative Pollution Regulation**

System	Types	Strengths	Weaknesses	Preconditions
Self-regulation	Full self-regulation (industry sets standards and enforces them), partial self-regulation (the state sets the standards and industry enforces them), co-regulation (government negotiates self-regulatory arrangement with industry associations), enforced self-regulation (government sub-contracts regulatory duties to individual regulated firms, oversees their self-regulation, and acts if it fails to work).	Speed, flexibility, market sensitivity, efficiency, and less government intervention.	In practice, may serve industry interests instead of common interests, leading to weak standards and ineffective enforcement.	Coincidence of self-interests of the company and public interests, enterprises are aware of each other's behaviour and can detect violations, industries can effectively co-operate in, for example, associations, there are means for punishing violations, consumers, customers or other clients who value and can identify compliance.
Education and Information	Education and training, corporate environmental reporting, public disclosure, product certification and eco-labeling, and award schemes.	Essential to environmental protection on all levels, maximizes the functioning of other instruments, cost-effective.	Cannot be relied on alone, often a gap between people's attitudes and behaviour, contains no precautionary instruments.	Trustworthy information on pollution, the existence of additional systems especially when there is a significant gap between private interests and pollution reduction and prevention. Works better for pollution that threatens health, is easily observable and measured, and where there is a well-defined community.
Economic Instruments	Property rights, market creation (emissions trading), pollution penalty fees, financial instruments (green funds, soft loans, and subsidized interest rates), liability instruments.	No need for direct state intervention, stimulates cost-effective and innovative approaches, continuing incentive.	Heavy reliance on hard to obtain information, risk of market failure, undesirable distributive impacts.	Functioning state pollution enforcement (for emissions trading and charges), access to judicial institutions (for property rights and liability instruments), targeted actors that make economic decisions and take action based on available information.

Source: Based in part on Gunningham et al. 1998.

*“On the contrary, alternative systems when used in the right combination with direct regulation, help to create more effective and efficient pollution regulations. The question that needs to be addressed, however, is what combination of strategies fits what kind of pollution in different economic, cultural, political, and geographic contexts.”*

These alternatives offer important additions to direct regulation in industrializing economies that may help to improve pollution regulation. They should, however, not be seen as full replacements for direct regulation and a basic functioning system of state enforcement. Alternatives tend to work better if there is a basic level of direct regulation and state law enforcement that can provide an incentive for self-regulation and that can provide the pollution and compliance information needed for education instruments. Meanwhile some economic instruments such as emissions trading and pollution charges require state law enforcement to punish those who fail to obtain the proper permits or pay the charges. Many of the preconditions for these alternative instruments are just as difficult to develop as the preconditions necessary for direct regulation, because there is often a conflict between the private interests of industry and the citizens and the common interests of pollution control. That is why you see the emergence of a lack of industry co-operation, fear of governmental pollution regulation, pressures from clients and consumers, and accessible and well-functioning legal institutions.

This does not mean that these alternatives should not be explored. On the contrary, alternative systems when used in the right combination with direct regulation, help to create more effective and efficient pollution regulations. The question that needs to be addressed, however, is what combination of strategies fits what kind of pollution in different economic, cultural, political, and geographic contexts.

## Notes

- 1 See: <http://www.inece.org/forumsindicators.html>.
- 2 This approach originates from the efficiency-based optimum enforcement or regulatory economics which argues that optimum enforcement should not be based on compliance but on the general cost benefits of society. See Bentham (1789), Becker (1968), Polinsky and Shavell (2000).



## Further Reading

*What different systems are available to regulate pollution?*

Ayres, I., and J. Braithwaite (1992), *Responsive Regulation*. New York: Oxford University Press.

Gunningham, N., P. Grabosky, and D. Sinclair (1998), *Smart Regulation, Designing Environmental Policy*. Oxford: Oxford University Press.

World Bank, (2000), *Greening Industry, New Roles for Communities, Markets and Governments*. Oxford: Oxford University Press.

*What causes industrial enterprises to comply with the law, even this leads to considerable costs?*

Gunningham, N., R.A. Kagan, and D. Thornton (2003), *Shades of Green, Business Regulation and Environment*. Palo Alto, CA: Stanford University Press, 2003.

Kagan, R.A., and J.T. Scholz (1984), "The Criminology of the Corporation and Regulatory Enforcement Strategies", in: *Regulatory Enforcement*, edited by K. Hawkins and J.M. Thomas, 67-95. Boston: Kluwer-Nijhoff Publishing.

Van Rooij, B (2006), *Regulating Land and Pollution in China, Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden University Press.

World Bank (2000), *Greening Industry, New Roles for Communities, Markets and Governments*. Oxford: Oxford University Press.

*What obstacles exist in the organizing of effective law enforcement?*

Hawkins, K (1984), *Environment and Enforcement, Regulation and the Social Definition of Pollution*. Oxford: Clarendon Press.

Hutter, B.M. (1997), *Compliance: Regulation and Environment*. Oxford: Clarendon Press.

Kagan, R.A. (1994), "Regulatory Enforcement", in: *Handbook of Regulation and Administrative Law*, edited by D.H. Rosenbloom and R. D. Schwartz, 383-421. New York: Marcel Dekker.

Stuligross, D. (1999), "The Political Economy of Environmental Regulation in India", *Pacific Affairs* 72, no. 3 (1999): 392-406.

Van Rooij, B. (2006), *Regulating Land and Pollution in China, Law-making, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden University Press, chapters 12-14.

*What are the most effective enforcement strategies in terms of compliance?*

Ayres, I., and J. Braithwaite (1992), *Responsive Regulation*. New York: Oxford University Press.

Kagan, R.A., and J.T. Scholz (1984), "The Criminology of the Corporation and Regulatory Enforcement Strategies", in: *Regulatory Enforcement*, edited by K. Hawkins and J.M. Thomas, 67-95. Boston: Kluwer-Nijhoff Publishing.

Lo, C.W.H., and G.E. Fryxell (2003), "Enforcement Styles Among Environmental Protection Officials in China", *Journal of Public Policy* 23, no. 1 (2003): 81-115.

Vogel, D. (1986), *National Styles of Regulation, Environmental Policy in Great Britain and the United States*. Ithaca: Cornell University Press.

*How can local communities force polluting enterprises to pollute less and comply with the law?*

Gould, K.A., A. Schnaiberg, and A.S. Weinber (1996), *Local Environmental Struggles, Citizen Activism in the Treadmill of Production*. Cambridge: Cambridge University Press.

Huq, M., and D. Wheeler (1993), "Pollution Reduction Without Formal Regulation: Evidence From Bangladesh", *World Bank Policy Research Working Paper* 1993-39.

Levine, N.M. (1994), "Between Choice and Sacrifice: Constructions of Community Consent in Reactive Air Pollution Regulation", *Law & Society Review* 28, no. 5 (1994): 1035-77.

Sonnenfeld, D.A. (2002), "Social Movements and Ecological Modernization: The Transformation of Pulp and Paper Manufacturing", *Development and Change* 33, no. 1-27 (2002).

*To what extent do market forces influence pollution compliance in industrializing economies?*

Dasgupta, S., B. Laplante, and M. Nlandu (1997), "Capital Market Responses To Environmental Performance In Developing Countries", *World Bank Policy Research Working Paper* 1909.

Gunningham, N., R.A. Kagan, and D. Thornton (2003), *Shades of Green, Business Regulation and Environment*. Stanford: Stanford University Press.

Van Rooij, B. (2006), *Regulating Land and Pollution in China, Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden University Press.

*What political conditions are necessary to enable effective state enforcement and community pressures on polluting firms in industrializing economies?*

Carmen de Mello Lemos, M. (1998), "The Politics of Pollution Control in Brazil: State Actors and Social Movements Cleaning up Cubatao", *World Development* 26, no. 1 (1998): 75-87.

Kagan, R.A. (1994), "Regulatory Enforcement", in: *Handbook of Regulation and Administrative Law*, edited by D.H. Rosenbloom and R.D. Schwartz, 383-421. New York: Marcel Dekker.

Van Rooij, B. (2006), *Regulating Land and Pollution in China, Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden University Press.

Wood, B.D., and R.W. Waterman (1994), *Bureaucratic Dynamics, The Role of The Bureaucracy in a Democracy*. Boulder: Westview Press.

*What are the alternatives to direct regulation, what are their prerequisites, and their advantages and disadvantages compared to direct regulation?*

Andrews, R.N.L. (1998), "Environmental Regulation and Business Self-Regulation", *Policy Sciences* 31 (1998): 177-97.

Gunningham, N., P. Grabosky, and D. Sinclair (1998), *Smart Regulation, Designing Environmental Policy*. Oxford: Oxford University Press.

Sinclair, D. (1997), "Self-Regulation Versus Command and Control? Beyond False Dichotomies", *Law & Policy* 19, no. 4 (1997): 529-59.

World Bank (2000), *Greening Industry, New Roles for Communities, Markets and Governments*. Oxford: Oxford University Press.



## References

- Arts, M.M.J., K.R.D. Lulofs, G.J.N. Bruinsma, and A.C.v. Wageningen (1998). "Bestuurlijke Risico's bij een beperkte toelating van afvalstoffenbedrijven (Administrative Risks of a Limited Authorisation of Waste Disposal Companies)", *Publicatiereeks Afvalstoffen, Ministerie van Vrom, Den Haag*, no. 43 (1998).
- Ayres, I., and J. Braithwaite (1992), *Responsive Regulation, Transcending the Deregulation Debate*. New York: Oxford University Press.
- Becker, G.S. (1968), "Crime and Punishment, An Economic Approach", *Journal of Political Economy* 76 (1968): 169-217.
- Bentham, J. (1789), "An Introduction to the Principles and Morals of Legislation", in: *The Utilitarians*. [??] Garden City: Anchor Books, 1789 (Reprinted in 1973).
- Carmen de Mello Lemos, M. (1998), "The Politics of Pollution Control in Brazil: State Actors and Social Movements Cleaning up Cubatao", *World Development* 26, no. 1 (1998): 75-87.
- Dasgupta, S., H. Hettige, and D. Wheeler (2000), "What Improves Environmental Compliance? Evidence from Mexican Industry", *Journal of Environmental Economics and Management* 39 (2000): 39-66.
- Dasgupta, S., R.E.B. Lucas, and D. Wheeler (1998), "Small Plants, Pollution and Poverty: New Evidence from Brazil and Mexico", *World Bank Policy Research Working Paper*.
- DiMento, J.F. (1989), "Can Social Science Explain Organisational Non-compliance with Environmental Law?" *Journal of Social Issues* 45, no. 1 (1989): 109-32.
- Economy, E.C. (2007), "The Great Leap Backward? The Costs of China's Environmental Crisis", *Foreign Affairs* 86, no. 5 (2007): 38-60.
- Gunningham, N., P. Grabosky, and D. Sinclair (1998), *Smart Regulation, Designing Environmental Policy*. Oxford: Oxford University Press.
- Gunningham, N., R.A. Kagan, and D. Thornton (2003), *Shades of Green, Business Regulation and Environment*. Palo Alto: Stanford University Press.
- Huisman, W. (2001), *Tussen Winst en Moraal, Achtergronden van Regelgeving en Regelovertreding door Ondernemingen (Between Profit and Morality, The Backgrounds to Enterprise Compliance and Violation)*. The Hague: Boom Juridische Uitgevers.

- Kagan, R.A., and J.T. Scholz (1984), "The "Criminology of the Corporation" and Regulatory Enforcement Strategies", in *Regulatory Enforcement*, edited by K. Hawkins and J.M. Thomas, 67-95. Boston: Kluwer-Nijhoff Publishing.
- MNP (Netherlands Environmental Assessment Agency). "China now no. 1 in CO<sub>2</sub> emissions; USA in second position", <http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/ChinanownorinCO2emissionsUSAinsecondposition.html>.
- OECD (2007), *OECD Environmental Performance Reviews: China*. Paris: OECD Publishing.
- Oposa, A.A. "A Socio-Cultural Approach to Environmental Law Compliance: A Philippine Scenario", INECE, <http://www.inece.org/5thvol1/5thTOC.htm>.
- Polinsky, A.M., and S. Shavell (2000), "Public Enforcement of Law", in: *Encyclopedia of Law and Economics, Volume V. The Economics of Crime and Litigation*, edited by B. Bouckaert and G. De Geest, 307-44. Cheltenham: Edward Elgar.
- Punch, M. (1996), *Dirty Business: Exploring Corporate Misconduct, Analysis and Cases*. London: Sage Publications.
- Sonnenfeld, D.A. (1998), "Social Movements, environment, and technology in Indonesia's pulp and paper industry", *Asia Pacific Viewpoint* 39, no. 1 (1998): 95-110.
- Van Rooij, B. (2006), *Regulating Land and Pollution in China, Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden University Press.
- Vaughan, D. (1983), *Controlling Unlawful Organisational Behaviour: Social Structure and Corporate Misconduct*. Chicago: Chicago University Press.
- World Bank (2000), *Greening Industry, New Roles for Communities, Markets and Governments*. Oxford: Oxford University Press.
- World Bank, and SEPA (2007), *Costs of Pollution in China, Economic Estimates of Physical Damages (Conference Edition)*. Washington: World Bank.

**About the Author**

This Research & Policy Note was written by Benjamin van Rooij, senior lecturer at the Van Vollenhoven Institute, Faculty of Law, and the Department of Chinese Languages and Cultures, Faculty of Arts, Leiden University.