ENVIRONMENTAL LAW PROGRAM

Using Law to Protect the Environment— Case Studies from Around the World

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in collaboration with
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CIEL

USAID

Using Law to Protect the Environment: Case Studies from Around the World

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Editors

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A Publication of
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Introduction

The case studies in this collection were compiled by the Center for International Environmental Law (CIEL) for the US Agency for International Development (USAID) to illustrate how law and related instruments can be used to bring about positive environmental change. These case studies are the first in what we hope will become a continuing series on the role of law in achieving environmental improvement around the world.

These case studies were selected by soliciting attorneys from different countries for their success stories. As an organization, CIEL works in partnership with environmental professionals around the world. Our goals are to promote public interest environmental law and public interest environmental lawyers, and to strengthen national environmental law systems. These case studies provide a forum for environmental advocates to showcase their successes.

The case studies in this collection are necessarily anecdotal. Often in developing countries extensive baseline data on environmental quality do not exist. Therefore it is not always possible to cite "before and after" statistics, for example, on the reduction of certain pollutants as the result of a particular law, regulation or enforcement policy. This, however, does not diminish the importance of these regulations in bringing about tangible environmental improvement.

We have attempted to present the case studies in a uniform format. Each of the case studies starts off by introducing the particular environmental problem that is the subject of the study. It then summarizes the legal mechanism designed to address this problem. In some cases this may be a particular law or regulation that was passed; in other cases it may be a contract or a government enforcement policy. The case studies then discuss whether the legal mechanism was successful, why or why not, and to identify some of the lessons learned. The following is a brief summary of each of the individual case studies.

Using Civil Litigation to End Long-Standing Dumping of Mining in Chile. The efforts of citizen groups in Chanaral provide a model for others in how to apply already existing Constitutional provisions to new environmental issues, like curbing environmentally hazardous discharges of mining wastes.

Using Enhanced Local Enforcement to Abate Water Pollution in China. This Chinese case study illustrates the need for local government involvement, even in the implementation and enforcement of national environmental laws. By empowering the local government authorities to respond to environmental problems in their region, the National People's Congress provided the means for targeted and efficient enforcement of federal laws.

Using Partnerships with Indigenous Peoples to Promote Wildlife Conservation in Utría Natural Park in Columbia. The pressures of expanding populations, the realization of the importance of preserving environmental resources, and the need to respect native populations have often been a source of great conflict in Latin America. The unique approach taken by government groups, NGOs and indigenous people in Colombia's Utría Park suggests that by including all groups in the early stages of planning, agreements to preserve wildlife can succeed not only in protecting environmental concerns, but also in helping increase understanding across cultures.

Using Public-Private Contract as a Mechanism to Ensure Benefits-Sharing from Biodiversity Prospecting in Costa Rica. Public-Private contracts to further environmental goals are a grossly underutilized policy tool. Costa Rica's use of an innovative contract between a pharmaceutical company and a government-chartered private, non-profit organization, provides one example where contracts can be used to preserve biological diversity, while at the same time allowing for biodiversity prospecting and providing a mechanism for sharing the benefits of that prospecting.

Using Activism to Force Environmental Reform in the Dominican Republic. The people affected by pollution from Falconbridge mines in the Dominican Republic provide a stirring example of how grassroots activism can be a powerful catalyst for environmental improvements. By requiring accountability from the miners, the people affected by the mine's harmful activities were able not only to force the mining company into paying more attention to the environment, but were also able to force the government to address the issue and pass stronger environmental legislation.

Using Civil Litigation and the Judiciary to Protect the Environment in India. This study provides an example of how civil litigation can use existing laws and constitutional provisions and a liberalized and respected judiciary to bring about positive environmental change.

Using Effluent Charges to Abate Water Pollution in Malaysia. In Malaysia a licensing and fee system was introduced to reduce water pollution created by the discharge from crude palm oil processing mills into Malaysia's rivers. A combination of initial study and public dialog, a progressive license-fee system, phased-in effluent standards, research and development incentives, and a few high-profile enforcement actions dramatically reduced these discharges.

Using Coordinated Enforcement to Protect Forests from Illegal Logging in the Philippines. The Philippines sought to deal with the problem of illegal logging by providing for a coordinated enforcement effort that involved all relevant government agencies. By doing so they were able to avoid the corruption and interagency turf wars that had hampered earlier efforts to protect the forests and put a system in place for future efforts.

Using Selected Criminal Enforcement to Protect the Integrity of Environmental Reporting Data in the United States. Pesticide regulations in the United States rely heavily on data generated by the regulated community. Through a combination of criminal sanctions to prevent fraudulent data reporting and judicious enforcement, the United States has been able to maintain a low-cost, effective, and, above all, accurate system of data reporting.

Using the Toxic Release Inventory to Reduce Toxic Emissions in the United States. The instigation of a publicly accessible national toxics database has led to a substantial voluntary reduction in toxic emissions in the United States. The American experience with the Toxic Release Inventory provides a telling lesson in the power that information has to promote change.

Using Government-Industry Partnerships to Achieve Regulatory Goals: The International Cooperative for Ozone Layer Production. The Montreal Protocol on Substances that Deplete the Ozone Layer is often hailed as one of the great success stories of international environmental law. Its imposition of clearly defined timetables for the phase-out of CFCs provided the necessary framework for innovative public-private partnerships to facilitate the use and distribution of environmentally friendly technologies.

We welcome your comments on the content and format of these case studies. We also welcome any suggestions for future case studies.

Finally, we would like to like to express our gratitude and admiration for the environmental lawyers and litigators whose stories made these case studies possible: Rafael Asenjo from Chile, Jim Howard from the United States, Christi Jorge from the Dominican Republic, Carolina Mauri from Costa Rica, M.C. Mehta from India, Antonio A. Oposa Jr. from the Philippines, and Hongjun Zhang from China. We would also like to thank the USAID Environmental Law Program for their comments and support: Orestes Anastasia, Eric Dannenmaier, David Foster, Leslie Johnston, and Bob MacLeod. We are also grateful for the editorial assistance of Allison Robertshaw and Neil Desai.

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Using Civil Litigation to End Long-Standing Dumping of Mining Wastes in Chile*

Introduction

Chanaral is a coastal town of 12,000 inhabitants 600 miles north of Santiago, Chile. Once a prosperous fishing village, Chanaral and the surrounding coastal area have been decimated by the more than 50 years of profuse dumping of tailing wastes generated by copper mines in the region. The millions of tons of wastes, in the form of a slurry, were dumped directly into the Salado River, which flows into the Pacific Ocean at Chanaral Bay. A flood in August 1987 covered the region with a thick layer of mining wastes and motivated the local population to seek an end to ocean disposal of the mine tailings.

Andes Copper Mining Company, a North American mining giant, initiated mining operations in 1927. In 1938 the tailings produced in the extraction process were first dumped into the ocean via the Salado River, a process that continued unabated until legal action ended it in 1989. In 1972 the Chilean government nationalized the Andes mines. The mines were subsequently operated by a state owned entity, Codelco. When deposits of the tailings threatened to close off access to the port of Chanaral in 1975, the government diverted the river and consequently the mining wastes to a point ten kilometers north of Chanaral.

The fact that the government was willing to divert the course of the Salado River is testimony to the position of enormous power and influence that Codelco has enjoyed in Chile. Copper mining is the most important industry in Chile and Codelco is the biggest player in the industry. As a result, Codelco has enjoyed a privileged position in the Chilean economy.

The ecological consequences of the long-term ocean disposal of the wastes were severe. The flora and fauna of the Chanaral Bay were entirely wiped out. The dumping had resulted in the creation of an artificial and lifeless shore hundreds of meters wide and kilometers long. Winds would carry a fine contaminated powder from the artificial beach areas into the town. In a 1987 study of the Chilean Pacific Coast, the Chilean Institute of Fisheries Development singled out the Chanaral area as the only area in which pollution was categorized as "severe and grave."

In September 1987, citizens and thirty-two different local organizations formed the ad hoc Citizens Committee for the Protection of the Environment and Development of Chanaral and hired Rafael Asenjo, a leading environmental attorney who would later become the head of Chile's first national environmental agency. The confrontation in

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* This case study was written by Stephen Porter and is based on a translation of the decision and description of the Chanaral case by the plaintiff's attorney, Rafael Asenjo, published in the Georgetown International Environmental Law Review. Mr. Asenjo also reviewed and commented on a draft of the case study.

Chanaral pitted a unified citizenry of a relatively small community against a large and powerful state-sponsored mining conglomerate. Although Chile now has a broad framework of environmental law, in the mid to late 1980s there was no national environmental policy, no environmental laws, and no effective institutional apparatus to oversee and manage its environmental resources. Moreover, the case arose against the backdrop of military rule, and with, ironically, an active army general operating Codelco. Notwithstanding these obstacles, the Chanaral committee and Asenjo ultimately succeeded in ending the disposal of copper mining and extraction wastes into the Pacific Ocean.

Summary of the Legal Mechanism

Because of the lack of both a formal environmental infrastructure and an effective legal framework for environmental protection, Chilean communities and their attorneys were forced to rely on two provisions in the 1980 Constitution. One guarantees the right to live in an environment free from pollution. The other provides for judicial recourse when the right to live in an environment free from contamination has been affected by an arbitrary and unlawful action imputable to an authority or a specific person.[1] On the surface, the goal of these Constitutional provisions is clearly to provide citizens with environmental rights and to provide at least limited recourse to defend these rights through the courts. Until the Chanaral case, however, the Constitutional language was widely perceived as nothing more than a placebo, particularly given the restrictions on the ability to enforce the right to a healthy environment in the courts. Indeed, the language of the Chilean Constitution was similar to constitutional provisions in a number of other countries where, at least in 1987, there was no right of judicial enforcement.

Regardless of the intentions of the drafters, and despite the restrictive political environment in Chile under military rule, activists were able to use these Constitutional provisions to develop a body of law that provided some environmental protection. Chile, like most South American countries, has a civil law tradition in which the courts' decisions have no precedential value, though the courts are nevertheless influenced by previous decisions. This is particularly true where, as here, the scope and application of the statutory framework are not explicit. Moreover, legal actions were used as a way of raising public awareness of environmental issues, thus paving the way for the ultimate

[1] Pol. Const. Rep. Chile, art. 19 and 20 (1980). Article 19, No. 8 guarantees to all persons "the right to live in an environment free from contamination. It is the duty of the State to watch over the protection of this right and the preservation of nature. The law may establish specific restrictions on the exercise of certain rights or freedoms in order to protect the environment." Article 20 reads: "He who should, due to arbitrary or illegal actions or omissions, suffer privation, disturbance or threat in the legitimate exercise of the rights and guarantees established in Article 19 . . . may on his own, or through a third party, resort to the respective Court of Appeal which shall immediately take the steps that it should deem necessary to establish the rule of law and assure due protection to the person affected, without prejudice to the other rights which he might invoke before the authorities or the corresponding courts. The recourse of protection shall also be applied in the case of No. 8 of Article 19, when the right to live in an environment free of contamination has been affected by an arbitrary and unlawful action imputable to an authority or a specific person." Asenjo, *supra* note 1, at 102, notes 19 and 20.

adoption of more specific environmental protection measures. This reflects a strong respect for the role of the judiciary and the rule of law in Chile. This deference to the judiciary has prevailed in Chile despite years of military rule and a tumultuous political situation caused by deep and enduring divisions within Chilean society.

What Happened?

In June 1987 a number of residents of Chanaral started to organize the community to respond to the environmental conditions created by the ocean disposal of mining wastes. Those that initiated the community action sought to involve as many existing community organizations as possible and formed the ad hoc Citizens Committee for the Protection of the Environment and Development of Chanaral in September 1987 following the flooding described above. After contacting Mr. Asenjo, the committee decided to seek injunctive relief to stop Codelco from continuing the ocean disposal of mining wastes. Using the simplified trial proceeding established by the Constitution, the case was filed with the Copiapo Court of Appeals.

The substance of the plaintiffs' case was to document the horrendous environmental damage done by the existing waste disposal practices and to highlight the inconsistency of those practices with a number of Chilean statutes, including *inter alia* the Industrial Waste Law of 1916, the Navigation Law of 1978, and the Fishery Law of 1983. With respect to the former, two events were critical to the citizens' success. First, the court compelled Codelco to disclose all the studies and reports that had been prepared over the years that documented the environmental degradation and in some instances recommended that the company adopt alternative disposal practices. Second, the Court of Appeals sent one of its members to conduct a site visit to observe first hand the effects of the pollution and to prepare a "court's personal survey" which provided irrefutable evidence for the citizens. This marked the first time that a Chilean court had been willing to use this evidence gathering technique in an environmental case and gave the citizens' assertions of ecological devastation increased credibility and persuasiveness.

The Court of Appeals found for the plaintiffs and ordered Codelco to end the ocean disposal of its wastes within one year. That decision was upheld on appeal to the Supreme Court. Subsequently, the government indicated that it would comply with the Court's ruling and invest more than $12 million to construct a tailings pond to hold future wastes.

Did the Legal Mechanism Work?

Taking the Constitutional provisions at issue in the Chanaral case at face value, it is clear that they worked in this case. They provided the citizens of a relatively small, remote community who had suffered the effects of severe environmental degradation with recourse against a very powerful, well connected adversary. Prior to the Supreme Court's decision, Codelco dumped roughly 346 million tons of toxic slurry into the ocean in the vicinity of Chanaral. Following the Court's decision, that dumping ceased. Experts expect that significant marine life will not return to the area for fifteen to twenty years. In

the meantime, a Canadian firm is studying the possibility of recovering copper and other minerals from the beaches formed by the decades of ocean disposal of mining wastes.

The Constitutional provisions were also indirectly responsible for raising the public's awareness of environmental issues generally through a number of highly visible cases (of which Chanaral is perhaps the best known example). In turn, this increased awareness has allowed Chile to take action to create a more specific body of environmental laws and to begin the arduous task of building the institutional capacity to effectively manage and conserve the environment.

Why Did the Legal Mechanism Work?

There are several reasons why the citizens of Chanaral were able to confront Codelco and successfully end the practice of ocean dumping of mining wastes. First, the case presented a well documented example of extreme environmental degradation. A number of studies prepared by both Chilean and foreign experts document the extent of the damage to the marine ecosystem. For example, a 1983 survey by the United Nations Environmental Programme listed Chanaral as one of the most serious cases of maritime industrial pollution in the Pacific Ocean. That many of these studies were commissioned by Codelco or its predecessors and virtually all were in Codelco's possession served to undermine the credibility of the company's arguments in court. Abundant anecdotal evidence of the demise of fish populations in coastal Chanaral and striking visual evidence of broad, lifeless beaches helped to capture public attention and sway the court. The pollution devastated the local fishing industry and thus the citizens were able to point to the effect not just on the environment, but also on an important economic interest. In addition, the report of the Court of Appeal judge who conducted an official visit to Chanaral and surveyed the damage both from the air and on the ground provided an unbiased account of the severity of the environmental damage. Moreover, the environmental degradation threatened coastal areas within a national park, highlighting the severity of the problem.

Second, the case arose at a time when the courts had begun to recognize the social consequences of pollution and were more willing to extend Constitutional protection to affected communities. The Chanaral case represented the culmination of a line of cases that established the contours of the Constitutional right to live in an environment free from pollution. Prior to these cases, the Constitutional terms "environment free from pollution," "preservation of nature," and "environmental heritage" had never been defined, let alone given legitimacy within the legal system in Chile. In part, the increasing judicial legitimacy of such concepts reflected an increasing societal awareness of the consequences of environmental harm.

The Chanaral case followed on the heels of several other efforts to utilize Chile's Constitutional environmental protections to alter environmentally destructive behaviors.

Several early cases were dismissed on procedural grounds.[2] However, once courts began to reach the merits of environmental cases, petitioners began to see results. In 1985, the Supreme Court upheld the suspension of an irrigation project at Lake Chungara as long as the lake remained a part of a National Park and on the UNESCO list of biosphere reserves.[3] In 1986, the Santiago Court of Appeals ordered the closure of a municipal garbage dump in Santiago, however, on appeal the Supreme Court allowed the dump to continue operations subject to compliance with new guidelines.[4] Mr. Asenjo had been involved in the Santiago garbage dump case, and brought the lessons he learned there to the Chanaral case. He points to two primary lessons: that the courts were willing to give substance to the Constitutional guarantee to an environment free from pollution; and that given the realities of life under the military regime, success in the courts would depend in part on the ability to show a clear public interest and broad public support for ending environmentally harmful activities without being perceived as an anti-government attack.

Finally, the community of Chanaral itself presented a unified and non-political front. Some previous attempts to enforce the Constitutional right to an environment free from pollution had failed in part because the legal action or the plaintiffs were perceived or portrayed as "anti-government." In previous cases, Mr. Asenjo had noticed a tendency among some plaintiff groups to subordinate environmental issues to a political agenda and that under such circumstances the courts were quick to find against the plaintiffs. At the same time, he recognized that success in individual cases and the ultimate success of environmental reform in Chile relied heavily on the involvement of the communities affected by environmental harm. Only then could environmental issues overcome Chile's divisive political and social climate and move closer to resolution. The community of Chanaral was not out to defy, embarrass, or discredit the military regime – they sought to address a legitimate environmental grievance. They were ultimately successful because they were able to stay focused on the environmental goal of stopping the ocean dumping of mine waste. That Chanaral is a relatively small and isolated community undoubtedly helped to avoid the politicization of the legal action against Codelco.

Regarding the larger issue of raising the environmental consciousness of the Chilean people, the Chanaral case presented such a clear and unequivocal example of industrial excess that it only served to galvanize popular support for environmental issues within Chile. While the Chanaral case received widespread news coverage within Chile, its impact was enhanced because it took place against a background of increasing awareness and concern for environmental issues.

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[2] Briefly, the courts had held that the Constitution would only prohibit interference with the right to live in an unpolluted environment if such interference was a) the result of an act and not an omission or failure to act and b) such acts were "arbitrary and unlawful."

[3] Plaza, Humberto, Comite de Desarrollo de Putre y CODEFF v. Ministro de Obras Publicas y otros. Recurso de Proteccion. Arica. Corte Suprema 19.12.1985. Rol. 824. *See also* Asenjo, *supra* note 1, at 104.

[4] Vargas, Aurelio y otros v. Municipalidad de Santiago y otros. Recurso de proteccion. Santiago. Corte Suprema 27.05.87 Rol. 10.561. *See also* Asenjo, *supra* note 1, at 105..

Lessons Learned

The Chanaral case represents a sound precedent for Chilean environmental litigation. In a society that lacks well developed environmental infrastructure and legal protections, such as Chile in the mid-1980's, a broadly worded Constitutional provision that provides environmental protection may lead inexorably to broader societal consensus on environmental issues and provide the foundation upon which subsequent laws and institutions can be developed.[5] Many recently adopted Constitutions have included some form of environmental rights in the enumerated rights that apply to citizens. In order to provide the basis for developing an environmental law regime, the Constitution itself or the judicial system must provide a means to enforce the environmental rights granted in the Constitution. Notably, the provision in Article 20 of the Chilean Constitution that grants recourse to the courts for protection of environmental rights is critical to giving life to those rights.

The political landscape upon which such a Constitutional right appears will determine how effective a tool it will be to promote environmental progress. For example, had Chile not been under military rule, political dissent may not have posed the threat that it did to environmental actions. The need to carefully divorce environmental actions from any taint of political dissent no doubt retarded the evolution of environmental law in Chile. On the other hand, perhaps such circumstances are precisely what calls for reliance on a Constitutional provision rather than a broad based social movement to draw attention to environmental issues.

The Chanaral case did not arise in a vacuum. It was one of a series of cases in Chile that gradually extended the authority and willingness of the judiciary to address environmental issues. These cases took place against a backdrop of increasing public support for improving environmental conditions. Those seeking to replicate the success of the citizens of Chanaral must bear in mind that resort to the judiciary is an ongoing process that will likely bring incremental as opposed to dramatic change.

The Chanaral case also highlights that the environment can be an issue that cuts across other political and social issues. In Chile, the awareness of environmental issues was new enough that it had not become associated with one side or the other in the traditional left/right division on political and social issues. The citizens were careful not to portray the issues in the Chanaral case as anti-government, but rather kept the focus on environmental degradation and its consequences. Those endeavoring to pursue analogous actions elsewhere must do likewise to build a consensus on environmental issues.

Equally important to the development of environmental law based on a Constitutional provision is finding the right case (or cases) to bring before the courts. The success in Chanaral was heavily dependent on the severity of the consequences and duration of the practice of ocean dumping at Chanaral combined with the ability of the

[5] See also the Case Study on India which provides a related examination of the use of constitutional provisions to protect the environment.

affected community to present a unified and reasonable objection to the practice. The case also represents the combination of good science and an aggressive litigation strategy by an organized community with the political will to protect the environment. Likewise, those seeking to replicate elsewhere the success of Mr. Asenjo and the citizens of Chanaral must carefully select and define the action they seek to bring and endeavor to provide the court with the best possible scientific evidence to support their case.

Using Enhanced Local Enforcement to Abate Water Pollution in China*

Introduction

This case involves the enforcement of waste water discharge standards at an industrial chemical plant in Shanghai, the most industrialized area in China. The plant, named Tian Chu, was first established in 1923 and was China's first monosodium glutamate plant. As one of the first few industrial entities in China, the plant has a positive reputation for its product. By the end of 1992, the net fixed capital of the plant was 20 million Yuan (2.4 million US dollars), making it a strong industry in China.

The major environmental problem associated with the manufacturing process was waste water discharge, which contains various organic pollutants. The daily chemical oxygen demand (COD) discharge was 25 tons, while the concentration of the waste water exceeded the National Waste Water Discharge Standards. To make matters worse, the waste water discharged directly into the Su Zhou river, which runs through downtown Shanghai. According to an investigation by the Environmental Protection Bureau of Shanghai City, the waste water discharge of this plant was one of the principal contributors to the pollution of the Su Zhou River.

The plant's backward technologies and processes were responsible for the high levels of COD associated with the waste water discharge. Most of the production equipment in the plant was installed when the plant was first constructed, and the technology lagged behind during the plant's seventy years of operation. Consequently, the production process of the plant was in a very poor situation, both from an environmental and productivity point of view. No waste water treatment facilities existed in the plant until 1995.

The plant is located in downtown Shanghai, which is one of the most developed areas of China. In contrast to other areas of China, the local community enjoys a higher standard of living, is better educated and more environmentally aware. The local community and many of the citizens of Shanghai city complained about the pollution of the Su Zhou River for many years, but the problem was not resolved because it was not considered very "urgent." Governmental initiatives to protect the environment eventually succeeded in addressing the problems.

Summary of the Legal Mechanism

The regulatory tool designed to fix the problem was the Program for Enhancing Environmental Enforcement, coordinated by the People's Congress of Shanghai City. This program was part of the national program initiated by Environmental Protection and

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* This case study was written by Hongjun Zhang the Deputy Director of the Legislative Office of the Environmental Protection and Natural resources Conservation Committee of the National People's Congress and was edited by Stephen Porter. It is based on the author's first hand experience.

Natural Resources Conservation Committee of the National People's Congress. It was designed to provide a framework and guidance for the environmental enforcement efforts of local governments and their environmental authorities which bear the primary responsibility for environmental enforcement. In addition, the national program required industrial entities within the respective local jurisdictions to comply with environmental laws, regulations and standards.

For the case of the Tian Chu plant, the program required compliance to the 1989 Environmental Protection Law (EPL) and the 1984 Water Pollution Prevention and Control Law (WPPCL). The primary legal requirements of these laws are the following:

Article 24 of the EPL states: facilities that cause environmental pollution and other public hazards shall incorporate the work of environmental protection into their plans and establish a responsibility system for environmental protection, and must also adopt effective measures to prevent and control the effects on the environment of waste gas, waste water, waste residues, dust, malodorous gases, radioactive substances, noise, vibration and electromagnetic radiation generated in the course of production, construction or other activities.

Article 28 of the EPL states: facilities discharging pollutants in excess of prescribed national or local discharge standards shall pay a fee for excessive discharge according to state provisions and shall assume responsibility for eliminating and controlling the pollution.

Article 29 of the EPL states: if a facility has caused severe environmental pollution, it shall be required to eliminate and control the pollution within a certain period of time.

Article 38 of the WPPCL states: a facility which has caused severe pollution to water bodies but has failed to accomplish required remedial actions by the deadline as required shall, as provided for by the state, pay twice or more the fee for excess discharge; additional fines may be levied in relation to the resulting damage and loss, finally, the facility may be ordered to suspend operations or close down.

What Happened?

With the help of the local environmental authority, the Tian Chu plant set up a technological innovation project to reduce the waste water discharge and to improve its production process in order to comply with the requirements of the enforcement program and applicable environmental laws, regulations and standards. This cooperative approach is typical of local efforts to curb pollution from industrial plants. Fortunately, in this case, the need to retrofit the factory with modern equipment coincided with the need to reduce waste water discharges.

The renovation project was designed to introduce the most advanced, high-level production equipment and production processes. The total investment of the project was 33 million Chinese Yuan (4 million US dollars). The project began in December 1992 and ended in December 1994.

The project yielded both environmental and economic benefits. After the project, the daily COD discharge of the plant reduced from 22 tons to 3 tons, and the waste water discharge met applicable national and local standards. The plant became more efficient by using a greater percentage of raw material inputs, and two by-products of the production process are now used for animal forage, the sale of which brings in additional income of 7.5 million Yuan (.9 million US dollar). In addition, the plant avoided the environmental discharge fee that would have cost the plant hundreds of thousand Yuan.

Did the Legal Mechanism Work?

The Environmental Enforcement Program, initiated by the National People's Congress and followed by local People's Congress, was a success. Through this program delegations of the National People's Congress have inspected all of the thirty provinces and autonomous regions. The People's Congress at the Provincial level inspected most of the cities and counties. The cumulative number of enforcement actions taken through this process numbers in the thousands.

Why did the Legal Mechanism Work?

The program succeeded for many reasons. First, there was sound coordination by the People's Congress at different levels. The National People's Congress sets up objectives and annual emphasis while the Local People's Congresses require and oversee environmental improvements at individual facilities by setting detailed procedures and time tables.

There was also positive cooperation by local governments and their environmental authorities. When the local government and their environmental authorities work in harmony, they achieve very positive results.

Another reason for the program's success is increasing support for improvements in environment quality among the general population. The environmental awareness of local people including industrial entities and leaders has been growing in recent years. Active media involvement has also helped. Every inspection delegation has members from media institutes. In addition industrial entities in China are beginning to be concerned about their public image generally, and their environmental reputation in particular.

Although it has produced considerable success, China's environmental enforcement program still has flaws. The enforcement program may be best

characterized as a "movement"[6] rather than a day-to-day enforcement effort. The reasons for weak day-to-day environmental enforcement are complicated. The major reasons are that environmental laws and regulations usually are too general and not specific enough to be fully operational; the enforcement responsibilities of competent authorities are somewhat vague while the legal liabilities imposed by law are not stringent; state entities present a particular problem of enforcement because they are owned by the state and are able to resist efforts to force compliance; environmental authorities do not have the adequate capacity to ensure environmental laws and regulations are enforced, in particular, they often lack financial support and personnel resources; and there is no effective mechanism for public participation, currently, the public usually only becomes involved in environmental activities when they become victims.

Lessons Learned

Enforcement is always crucial after the enactment of legislation, particularly in developing countries which may lack the resources necessary for enforcement. A common complaint from developing countries is that the laws are good, but they are not enforced. Environmental enforcement in China is generally weak.

To make environmental enforcement in China more effective, comprehensive measures should be introduced. These measures must be integrated and include legal, economic, technical, institutional and educational components. The following recommendations aim to promote environmental enforcement of China:

First, legal documents should be made more operational. The vague provisions of the legal documents often cause confusion on the part of both enforcement bodies and industrial entities. In the process of drafting and formulating legal documents, legislators should make efforts to explore detailed, workable, and effective regulations.

Programs should build stronger enforcement capacity. Training and educational programs should be created within the enforcement bodies to improve the capacity of personnel. More budget resources should be given to local environmental authorities, who have front line enforcement responsibility.

The government should encourage active public participation. The government should give more opportunity for public involvement in environmental impact assessment. In addition, the formation of non-governmental organizations should be encouraged and they should be permitted to take more functional activities.

Effective economic incentives should be introduced. Economic incentives, although they require careful evaluation, are highly effective policy instruments,

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[6] Movement in the Chinese sense refers to a government based program that receives a lot of attention and resources for a period of time, and then generally fades in importance. It does not refer to a popular movement as we know it in the USA.

particularly where economic constraints prevent industrial entities from making environmental improvements.

Finally, environmental enforcement should be made more routine. The enforcement movement, such as the program with respect to the Tian Chu plant discussed above, is an effective tool to promote the local environmental enforcement, however, such a program cannot replace ongoing, day-to-day enforcement activities. A more effective day-to-day enforcement approach should be explored.

Using Partnerships with Indigenous Peoples to Promote Wildlife Conservation in Utría Natural Park in Colombia*

Introduction

In recent decades, human activity has placed a serious burden on global resources and on the world's ecosystems, visible throughout the entire world, from massive deforestation and species extinction to the loss of invaluable resources. Research has shown that nowhere has such destruction occurred faster than in Latin America.

As awareness of such problems grew during the 1970s, many Latin American countries established protected areas to safeguard their biological resources. The Utría Natural Park, located on the northern pacific coast of the state of El Chocó, is one of the protected areas created in Colombia. The area is classified as a tropical humid forest and contains a level of biological diversity considered outstanding on a global scale. This important area has also been included in the USAID/The Nature Conservancy Parks in Peril Program.[7]

Roughly 85 percent of the Utría Park is also home to indigenous peoples called the Embera, who depend on the resources of the Park for survival. The Embera communities base their economies on the natural resources of the forest. They have been greatly affected by the decline – and in some cases the disappearance – of certain species of game fauna.

During the late 1980s there were significant declines in the populations of several ecologically vulnerable species that are vital to the Embera, including the mountain pig *(Tayassu percari)*, the tapir (*Tapirus baiirdi)*, the spider monkey (*Ateles fusciceps)*, and the howling monkey *(Alouatta palliata)*. In some areas, these species have disappeared entirely. The mountain pig is of particular importance to the Embera for its symbolic and traditional significance, its importance as an alternative food source, and its importance in the stability of the ecosystem.

As a result of these problems, many groups have developed an interest in the fate of the Utría Natural Park. The Ministry of Environment has authority over the Park and responsibility for maintaining its biological resources. The Regional Indigenous

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* This case study was written by Christie Jorge Santelises and edited by Stephen Porter. This case study is based on an unpublished 1996 report by the Natura Foundation of Colombia "Management of Game Fauna with the Embera Indigenous Communities in the Area of Influence of the Utría Natural Park (Chocó, Colombia)", The Nature Conservancy, *Parks in Peril Source Book*, Eric Dinerstein et al, *A Conservation Assessment of the Terrestrial Ecoregions of Latin America and the Caribbean,* and a personal interview with Heidi Rubio-Trogler, Project Director of the Natura Foundation, the NGO that coordinated the management initiative described in this case study.

[7] The Parks in Peril Program is an emergency effort to safeguard the most important and imperiled natural areas in the hemisphere created by The Nature Conservancy and sponsored in part by the United States Agency for International Development.

Organization Embera-Waunana (OREWA) is concerned about the treatment of indigenous people. Local NGOs, chiefly the Natura Foundation, are concerned about the balance between people and preservation and the long-term fate of the Park. And, of course, the local communities of the Embera have their livelihood and way of life at stake. Such a situation presents a classic dilemma – how to take into account both the needs of the indigenous peoples and at the same time prevent the depletion of wildlife species within the Park.

The result has been a unique joint effort to involve the Embera in designing a wildlife management program that preserves not only the threatened forest species but also the Embera's way of life.

Summary of the Legal Mechanism

In 1990, the Natura Foundation, the Ministry of the Environment, OREWA, and the indigenous communities launched an innovative and ambitious project known as the Management of Game Fauna project with the Embera Indigenous Communities in the Area of Influence of the Utría Natural Park. The project is designed to promote a local approach to developing a long-term wildlife management plan for the Park and its environment by facilitating the Embera's own efforts to manage the ecosystem.

The project is based on two framework agreements: one between the Ministry of Environment, the indigenous communities and OREWA for the joint management of the resources in the area; and a second agreement between the Ministry of Environment and the Natura Foundation to establish a relationship with the inhabitants of the Park.[8] The Natura Foundation has been the driving force behind the development of this innovative approach to managing lands that are also a public resource and the homeland of indigenous peoples.

The conceptual methodology used in the project, known as "interactive participation," is critical to the success of the project. Interactive participation has five basic elements: (1) it is intercultural in its search to promote the exchange of knowledge, loggias and the ways of actions among both cultures; (2) it is participatory by promoting equal dialogue and respect among the different actors; (3) it has an interdisciplinary nature and seeks a joint vision of the problem and searches for solutions in both the natural and social sciences; (4) it seeks autonomy on the part of the indigenous communities in the sense that they must establish their own priorities and a management program that reflects those priorities; and (5) it relies heavily on communication by exploring different systems of interpretation and representation of cultures, in order to facilitate the identification of priorities and development strategies to accomplish them.

[8] The legal basis for the OREWA and the special status of indigenous groups in Colombia derive from the Colombian Political Constitution of 1991, and Law No. 1889 of 1989.

What Happened?

The project consists of four phases that are being executed over a nine year period (from 1990-2000). Phase One is designed to collect data on the game fauna populations, the hunting methods and land use practices of the Embera, the traditional uses of the fauna, and the Embera's perceptions of wildlife, hunting, and conservation. Phase Two involves the identification of strategies and management alternatives for the Park's wildlife resources. Phase Three is the implementation of the measures identified in Phase Two. Finally, Phase Four will evaluate, in the short term the effectiveness and efficiencies of the practices conducted under the new strategies.[9]

Phase One of the project was carried out with only four of the sixteen Embera communities in the affected area. This phase consisted of: the collection of data and the creation of an inventory of the existing fauna in the Park; an analysis of the Embera's hunting methods; an analysis of the use of the territory and the creation of maps of the territories used by each community for hunting, fishing and agriculture; a census of the total population in the area; an analysis of the use of the fauna (e.g., for food source, commerce, decorative purposes, etc.); and an assessment of how the Embera view hunting, the fauna itself, and conservation.

This work was conducted with a team of biologists and sociologists from the Natura Foundation, indigenous co-investigators, a representative of the OREWA, and a representative of each of the four affected communities. The community council selected the co-investigators. The co-investigators compiled the data and various members of the four communities conducted inquiries.

The objective of Phase Two was to explore the strategies for the sustainable management of the game fauna within the communities. This process was conducted through workshops, discussions, and formal and informal meetings held by the community council and the local NGO. Participation was promoted and sought at every stage. Phase Two consisted of: transferring the data obtained during Phase One to the communities; researching the most appropriate methodology to develop a dialogue between the Western and Embera cultures; providing for community discussion of the results of the research; exploring with the indigenous communities strategies for management of the fauna, taking into consideration socio-cultural and biological viability; identifying the communities that would test the strategies; building the capacity of a group of indigenous leaders to manage natural resources; and determining the best channels to communicate the management information throughout the Embera communities.

The management alternatives ultimately selected by the communities were: responsibility for control of the fauna in the medicine man (jaibana), establishing refuges

[9] Phases Three and Four have not yet been implemented.

in which hunting is forbidden, prohibiting hunting for certain seasons, encouraging marine fishing as an alternative food source, and breeding of minor species.

Phase Three will implement the management alternatives identified above and generate evaluation and monitoring methods. Communities will implement the refuge and seasonal hunting prohibitions and assist in the management of fauna respecting traditional ways. Like Phases One and Two, Phase Three is designed to maximize participation in the management process. Phase Four will evaluate the short-term effectiveness and efficiencies of the practices conducted under the new strategies.

Did the Legal Mechanism Work?

Although the project is only in its sixth year, Phases One and Two have proved to be successful. However, the ultimate evaluation of this entire approach must await the implementation of the new wildlife management practices now taking place under Phase Three of the project.

The Embera community, in coordination with the NGO and OREWA, has sought a solution to the problem in a joint manner, combining scientific and traditional knowledge. Although the Embera have special rights over their lands and a unique cultural heritage, they have accepted the intervention of other Colombians and scientists in shaping their perception of conservation of the environment and in addressing issues that will determine the survival of their culture – their own sustainability.

The project has resulted in many changes. First, it has improved the quality of life. The project seeks to offer food security to the communities in the form of animal protein which indirectly improves health conditions, and has generated a variety of educational material at an informal level (through pamphlets and seminars), as well as formal materials with work conducted in schools.

The project has also had various impacts on the environment. The Embera have decided to establish refuges and closed hunting seasons. There has also been a change in their perception of environmental problems and their causes. Environmental problems have now become a basic concern for the community since they understand the cause and effect link between unsustainable hunting practices, vulnerability of the species and their own survival.

There has been a change and strengthening of the culture. Community elders, medicine men, and others participated in the workshops and seminars dealing with the feasibility of the alternatives to manage the fauna. The NGO has created a space for dialogue where other members of the community and the researchers could listen to traditional knowledge. The elders claimed that these dialogue spaces had helped them obtain more knowledge of the fauna existing in the region and of how that knowledge had to be taken into consideration. This exchange of knowledge led to one of the strategies for managing the fauna through the medicine men. There was substantial participation

during both phases of the project of the communities of the region, through indigenous co-investigators and representatives from the OREWA group. The OREWA absorbed and internalized the methods and concepts of the project within the policies of its organization.

The project also has had a favorable impact on the community organization itself. It has helped strengthen the traditional community leaders (e.g., medicine man), as well as the new ones (e.g., OREWA representatives, council persons, professors) as important actors in the decision-making process. It has also strengthened community organizations internally (through workshops, etc.), and it has empowered the community councils to take action to manage their wildlife resources (e.g., establishing refuges).

Why Did the Legal Mechanism Work?

The success of this type of approach relies mostly on whether the affected community perceives an environmental problem and recognizes the need to take action to redress the problem. Although the NGO conceived the project, it was later enriched through the participation of the OREWA, the Ministry of the Environment, the indigenous communities, and the co-investigators. During Phase One, the scientists and co-investigators worked and lived *in situ* for approximately one year, and thus developed close and constant working relationships with the communities and the delegate of the OREWA. This resulted in the Embera accepting the project as a part of their culture and future.

According to the NGO, the indicators of success can be summarized in project design and project implementation. The project design: was accepted by all of the actors involved – institutions as well as the communities; responded to possible changes in political, social and cultural scenes; took a long-term approach to the problem, with objectives defined on a step by step manner; was created in interdisciplinary manner that required participation at both the institutional and community level; and stressed the need for and created open spaces to allow dialogue and interactive community participation. In implementing the project: all the stakeholders participated (e.g., communities, government organizations and the Natura Foundation); the community had knowledge of each step in the process; community involvement served as an incentive for decision-making in the communities themselves; participation produced dialogue and reflection spaces; the State actively participated through the Ministry of the Environment; a broad range of the community participated (e.g., gender, traditional leaders, elderly, youth, etc.); basic data on the area and fauna were obtained; and the community chose the sustainable management of the fauna to ensure their long-term food security.

Lessons Learned

Final assessment of the project must await the implementation of Phases Three and Four (to be completed by the year 2000) when the data will show whether the number of

game fauna has stabilized and/or increased due to sustainable hunting practices. Nevertheless, Phases I and II can provide important lessons for the future.

As a result of this project, the Ministry of the Environment can use the method implemented in this joint endeavor in any of approximately fifteen other natural parks in Colombia that to some extent share parts of their territories with Indian reservations. In addition, other countries that also have indigenous populations may also be able to follow this model.

There are, however, pitfalls to this type of approach. Since the project is a joint endeavor and is led by an NGO, rivalries and tensions exist between the institutions involved in a struggle for power and ultimate leadership. This dynamic was perhaps compounded by the weak negotiating power of the OREWA before the State and a centralization of decision-making authority within the Ministry of Environment. Certain conflicts also existed between the OREWA and the indigenous communities themselves. On many occasions the OREWA failed to fully grasp the social realities within each community.

In addition, many conflicting laws and regulations govern the indigenous reservations and the protected area itself. Until these conflicts are resolved, many obstacles cannot be removed.

Finally, from a cultural perspective, there are also various obstacles. For example, there are two different perspectives on extinction, different perspectives on finding a solution to the problem, two different languages, and different means of communication and transmission of acquired knowledge. However, the experience thus far with the Utría Natural Park project illustrates that these obstacles can be overcome and that progress toward sustainable co-existence is within our reach.

Using Public-Private Contract as a Mechanism to Ensure Benefits-Sharing from Biodiversity Prospecting in Costa Rica*

Introduction

Pharmaceutical companies often use substances from plants, animals, soils and micro-organisms to develop new pharmaceuticals. Natural products are sources of unique chemical compounds, which may eventually be developed into commercially successful pharmaceuticals. Compounds found in the rosy periwinkle, for example, led to the development of a treatment for leukemia which yields $100 million in sales annually. Approximately 25 percent of the drugs prescribed in the United States were developed from compounds extracted from plants. These drugs accounted for an estimated $15.5 billion in sales in 1990.

The process of developing marketable pharmaceuticals from natural products is long and costly. On average, 10,000 compounds must be tested to obtain one product that has the potential to be developed into a commercial pharmaceutical. In the US pharmaceutical industry, a commercially marketable drug requires an investment of approximately $231 million and 12 years to develop.

The large number of products that must be tested to obtain a commercially usable product and the high cost involved created a lull in natural product research during the 1970s. Companies attempted to replace natural product research with chemical synthesis of pharmaceuticals. Improvements in the techniques for and efficiency of screening chemicals for potential development into pharmaceuticals took place in the 1980s. These improvements made large natural product screening feasible and affordable and also led to a renewed interest in biodiversity prospecting as a source of novel chemical compounds.

With the renewed interest in natural product research came concerns about benefits sharing from that research. Most pharmaceutical companies are in developed countries, while the largest reservoirs of the world's biodiversity are in developing countries in the tropics. These companies often either prospected for natural products on their own, without providing any benefit to the source country, or they simply paid a fee to local people for their services in extracting products (e.g., collecting specimens for the company).

The costs associated with collecting samples, however, do not solely involve paying someone to gather samples. They include costs associated with maintaining

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* This case study was developed from a research paper by Carolina Mauri, a Costa Rican lawyer, and edited by Claudia Saladin of CIEL. It is based on the publication *Biodiversity Prospecting: Using Genetic Resources for Sustainable Development* (Reid et al., eds. 1993), which includes papers by INBio staff and reprints some of the documents related to INBio, although not the Merck-INBio contract itself.

biologically diverse areas, such as national parks, where such samples can be collected. The cost of maintaining protected areas and preserving species is typically borne by the source country and is an externality for which pharmaceutical companies often do not pay. Developing countries, indigenous leaders and environmentalists have increasingly called for the internationlization of these costs in the cost of biodiversity prospecting.

In addition, during the 1980s there was growing concern, particularly among developing countries, that foreign pharmaceutical companies were making or might potentially make considerable profits from the products they developed from materials gathered in third world countries. Some suspected that these companies might even patent these materials, without sharing any of the benefits with the source country or paying the real cost of preserving areas of biodiversity for sampling. This case studies one of the first attempts at sharing the benefits of private pharmaceutical research with the source country, while also attempting to conserve Costa Rica's rich reservoir of biodiversity.

Summary of the Legal Mechanism

An innovative agreement between the Merck pharmaceutical company and the Costa Rican National Institute for Biodiversity (INBio), a government-chartered private, non-profit organization, sought to remedy this situation. INBio was by a Commission comprised of government representatives, academics and NGOs. Although INBio is a private organization, it is closely tied to the government of Costa Rica: most of the members of INBio are government officials, and much of its work is carried out under an agreement with the Ministry of Natural Resources, Energy and Mines (MIRENEM). INBio's agreement with MIRENEM covers their joint inventory of the biodiversity in the system of protected wild areas. That agreement further provides that 10 percent of any budget for a research project, and 50 percent of any financial benefits INBio receives will be donated to the National Parks Fund of MIRENEM.

What Happened?

Merck and INBio originally signed the agreement in 1991 and then renewed it in 1994. Under the original agreement, INBio provides Merck with genetic resources from national conservation areas in Costa Rica. The objective of the agreement is to develop new drugs from chemicals found in wild plants, insects and micro-organisms. INBio received $1,135,000 for two years of research and sampling and is entitled to a percentage of the royalties in the event a discovery leads to a new commercial product (this percentage has not been disclosed). Merck will own the rights to any patented material. Ten percent of the budget received by INBio and fifty percent of any royalty they receive goes to the MIRENEM, for maintenance of the National Parks and Conservation Areas in which INBio does its research. As part of the agreement, Merck also agreed to provide equipment and training to INBio. Costa Rica's hope is that eventually such transfers of technology and knowledge will lead to the development of a domestic pharmaceutical industry.

Did the Legal Mechanism Work?

Costa Rica, having over 4% of the world's biodiversity, a highly-educated population and a stable political system, is perhaps an ideal place to implement an innovative mechanism that attempts to combine benefits sharing and biodiversity. It is too early, though, to make any definitive determination about the success of the Merck-INBio agreement. As of now, the process has not yielded any marketable pharmaceuticals. However, given the time required to develop pharmaceuticals, this is not surprising. The most tangible benefits thus far are the 10 percent of the sum immediately provided to the government of Costa Rica for maintenance of the National Parks. In addition, INBio has benefited from equipment, training and personnel exchanges with Merck. Moreover, the agreement has set a good precedent. Merck is now paying up front for biodiversity prospecting, whereas pharmaceutical companies in the past often paid nothing. Other companies have started to negotiate similar agreements with local communities or national governments. The potential for ongoing royalties also provides Costa Rica with the incentive and the means for preserving its biodiversity.

Lessons Learned

Although the agreement was the first of its kind and attempted to address the benefits sharing question, it is not without controversy. One objection is that INBio is, in essence, "selling" Costa Rica's genetic resources, since Merck will own the patent on any medicines developed from samples provided by INBio. The creation of INBio effectively privatized access to Costa Rica's biodiversity. Because the Merck-INBio agreement is between two private entities, the terms of the agreement itself are confidential. Although 50 percent of any royalties INBio earns will go to the National Park Fund, the exact percentage of royalties to which INBio is entitled will not be made public. Moreover, many of the benefits from this agreement will be enjoyed by INBio, which is technically a private organization, although it has numerous ties to the government. Moreover, because INBio is essentially a private entity, it is not subject to the same public scrutiny as a government agency and it can invoke the rules concerning confidentiality to limit public access to information.

Using Activism to Force Environmental Reform in the Dominican Republic*

Introduction

Since the late 1950s, Falconbridge, a Canadian mining company has possessed the rights to operate a ferro-nickel mine in a rural area of the central Dominican Republic near a town called Bonao. For over ten years, Falconbridge explored the site to determine what minerals might profitably be extracted, while conducting extraction operations in other parts of the country. In 1971, Falconbridge began mining operations at Bonao.

Documents obtained from the Dominican Ministry of Commerce and Industry indicate that Falconbridge originally obtained the right to explore and exploit the Bonao site in December 14, 1956 through a concession agreement from the state-owned mining company that previously held the mineral rights to the site. It is unclear whether and to what extent the state-owned company had previously extracted minerals there.[10]

The Falconbridge mining operation first became the source of public concern in the 1980s when the community of Bonao began complaining that Falconbridge's operations were polluting local rivers and contaminating drinking water supplies. While the residents of Bonao were primarily concerned about the potential health effects of the Falconbridge operations, they also complained about deforestation of the hills that surround the mine, excess air emissions from facility operations, and the mismanagement of wastewater, which was discharged directly into local rivers. Local press reported that Falconbridge's wastewater was causing the death of livestock, harming local crops and making water in the surrounding area unfit for human consumption.

As a result, neighborhoods formed committees to address the environmental issues and to establish a dialogue between the community, the local government, local parishes of the Catholic church, and Falconbridge representatives. Several of these informal committees petitioned the Dominican President, with the aid and support of the Catholic church, asking the government to designate certain areas near the mines as

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* This case study was prepared by Christie Jorge Santelises, a lawyer from the Dominican Republic and edited by Eric Dannenmaier. It is based on local press reports and interviews with the public relations director of Falconbridge, the lawyer who prepared the suit against the company (which was threatened but not filed), and a representative of INDOTEC, the company that prepared a proposed EIA plan to be conducted at Falconbridge (never conducted due to lack of funds).

[10] Falconbridge obtained the rights to the Bonao site from CompaZia Minera y Beneficiadora Dominicana, C. por A. (CMBD) through a series of contracts culminating in a concession for a site designated Quisqueya 1, dated December 24 1956. While none of the documents effecting the concession of mineral rights at the Bonao site contain explicit conditions regarding environmental practices, the December 24 concession does state that Falconbridge agrees to conduct its exploration and exploitation activities in the Quisqueya 1 site and in those that may be granted in the future . . . according to the best mining technique and security norms.

environmental reserves and to prevent further deterioration of the land through Falconbridge's mining operations. Initially, these actions accomplished next to nothing. The President took little interest in environmental issues, and Falconbridge was unresponsive to community concerns.

In June 1989, community activists from Bonao held a march to protest the continuing pollution generated by Falconbridge. The marchers protested the resulting environmental damage and demanded a portion of the profits from the Falconbridge operations to address local concerns about health problems and the loss of valuable crops. The demonstration resulted in violent confrontations with police, dozens of injuries, including the death of a young man, and the arrest of many demonstrators.

The violence of the demonstration was widely reported, and several Dominican congressmen responded by introducing a law that would have required all mining companies to share five percent of their profits from mining operations with local host communities. While the Dominican Congress eventually passed the proposed legislation, the President vetoed it.

In 1990, another violent incident occurred near Falconbridge when two men were allegedly killed by members of the Falconbridge security department after they were found fishing in a reservoir on the company's property. Local environmental activists claimed that the reservoir was polluted and cited the incident as further evidence that Falconbridge had something to hide. Despite calls for an investigation and prosecution, no charges were filed.

Summary of the Legal Mechanism

The Dominican Republic has no law that would allow direct redress of the environmental concerns about Falconbridge's operations. The country has many resource and media-specific laws, but their terms are very broad. Dominican law does not set, for example, a maximum contaminant level for discharges of toxic substances from mining operations.

Falconbridge's mining concession agreement with the Dominican state also included a general provision that might be interpreted to create certain environmental responsibilities. This provision is contained in the first article of the agreement. It states: "the company agrees to explore and exploit the sites ... with the best mining techniques and security norms ..." Again, this provision is very broad, and it is unclear that "best techniques" and "security norms" were intended to have an environmental significance.

Unfortunately, neither the Dominican law nor the concession agreement created clear legal recourse against Falconbridge for the contamination caused by its mining operations. In addition, even if clear recourse existed, investigating Falconbridge's operations and their impact on the environment was difficult, if not impossible. Dominican law does require some assessment of expected environmental impact prior to

the grant of a mining concession, but the assessment data is not publicly accessible. Moreover, no continuing emission records or audit data must be produced or reported.

By 1993, community complaints about Falconbridge reached a critical point as citizens of Banao became increasingly dissatisfied with the company's efforts to address environmental concerns. The combination of local unemployment concerns and the community complaints led to further violence. In an earlier attempt to obtain some level of community support, Falconbridge had implemented a policy that provided temporary employment to many local workers. When the company ended this plan in 1994, disaffected locals rioted, injuring many of Falconbridge's employees, and damaging company vehicles and equipment.

The Dominican Congress again sought to address some of the issues at Bonao, this time by passing Resolution 97-94 . This resolution established a special technical commission to take the appropriate measures to "restrain the predatory effect of the mining exploitation that Falconbridge is causing from its installations in Bonao." The President signed Resolution 97-94, and the commission became a focal point for community concerns.

What Happened?

The special commission analyzed the environmental impact of Falconbridge's mining activities, and found serious water contamination in the area where its wastewater treatment plant was located, and widespread deforestation caused by Falconbridge's mining techniques. The commission concluded that the company had taken few precautions to contain toxic discharges and to protect local inhabitants and the nearby environment. The commission found that although the Falconbridge has attempted to address some of the problems its efforts have been insufficient in light of the level of contamination that its operations had caused.

Falconbridge responded to the commission report in November 1994 by conducting its own environmental impact assessment. The Falconbridge assessment concluded that the company's operations were not harming the environment in Bonao nor causing physiological reactions in humans or animals.

Dissatisfied with the Falconbridge assessment, and armed by the commission reports, the community threatened to file a multi-million dollar law suit seeking compensation for health disorders and the contamination of food crops. Local citizens continued to press for changes in facility operations and for environmental accountability at Falconbridge. They were organized and supported in large part by a local Catholic priest, who had spearheaded the threatened suit, and had helped to keep Falconbridge's actions and the citizen complaints in the news.

Did the Legal Mechanism Work?

While it is too early to tell what the ultimate environmental fate of the Falconbridge mining area will be, it appears that the legal tools created in the Dominican Republic have had some positive impact. The special commission report, subsequent threats of litigation, and the constant community pressure on Falconbridge seem to have had some impact for the present. While there are still widespread problems at the facility, and the community remains largely dissatisfied, reports indicate that the special commission is beginning to have an impact and that a dialogue between Falconbridge and the local community has finally begun.

Although the threatened suit has never been filed, the Falconbridge case marks the first time in the Dominican Republic's history that a community has taken such a stand against a transnational corporation on environmental issues, and the first time that local citizens have openly chastised the Government for its lax supervision of a company's negligence and demanded legislative change.

Why Did the Legal Mechanism Work?

A combination of factors contributed to the limited amount of success realized in the Dominican Republic. Most importantly, the creation of a special commission, the engagement of the local community, and the threat of litigation, brought Falconbridge to the negotiating table and created a basis for positive change. Ultimately, without the creation of a legal basis for dialogue (in the form of the special commission) and the continued interest of the local community (led in this case by a local priest) it is unlikely that any positive change would have occurred.

Lessons Learned

The Falconbridge case suggests a number of important recommendations for addressing the environmental impact of industrial operations on small communities. Most importantly, a legal basis for accountability must exist in the law. In this case, Falconbridge was able to conduct its business without apparent interest in environmental consequences for many years because no law or contract existed that required such considerations. These issues could have been addressed through national legislation or through the concession agreement, but they were not.

Moreover, no mechanism existed that would allow anyone to determine the extent of Falconbridge's threat to human health and the environment. Citizens were without basic information about Falconbridge's environmental performance, even after their existed a strong local interest in obtaining such information. Thus Falconbridge had, in essence, a license to pollute, and there were no institutions to revoke that license short of national legislative action. Ultimately, public pressure led to a legislative response, and to a basis for change. While the legislation did not explicitly create a right to sue, it created a basis for dialogue, and for investigation of the impact of Falconbridge's operations. This, in turn, created a credible threat of legal action.

What remains to be addressed in the Dominican Republic, and what ultimately led to the impasse at Falconbridge, is the lack of a clear basis for judicial action against the company for environmental damages. Without clear, enforceable environmental standards, and citizen standing to sue in the face of the administration's inaction, clear solutions to problems such as those in Bonao will not exist.

In sum, the elements that have led to positive change in Bonao, and that are recommended elements of public policy are: access to information about the environmental impact of industrial operations; legal standards that establish maximum levels of air and water emissions (and thus establish a basis to sue and enforce such standards); and, a basis for public dialog between industrial facility operators and affected local communities.

Using Civil Litigation and the Judiciary to Protect the Environment in India*

Introduction

India presents one of the most interesting and informative studies of the role of the judiciary in bringing about positive environmental change. India, the world's second most populous country, has a rich and vibrant history and culture. However, since independence in 1947, India has undergone rapid development. An unfortunate by-product of this development is serious and pervasive pollution and environmental degradation. Air pollution is causing discoloration and deterioration of the Taj Mahal, a World Heritage Site and one of the seven wonders of the world. Severe contamination threatens the sacred Ganges River and the health of the millions of ceremonial bathers who flock to the Ganges during religious festivals. Dust and particulates from stone crushing operations in urban areas cause widespread pulmonary disease. Groundwater in some areas is so polluted that it cannot even be used for livestock or agricultural purposes. Finally, two of the largest sources of greenhouse gases in the world are located in India.

India does have many environmental laws, many of which were passed in 1972 following the Stockholm conference on the global environment and again in the mid-1980s following the Bhopal tragedy. In fact, India has over 200 laws at various levels of government that contain environmental provisions. In reality, however, these laws have not been effectively enforced at least in part because of the concerted efforts of powerful economic interests that have resisted bearing the costs of compliance. As a result, environmental degradation has become an increasingly serious problem in India, particularly as people migrate to the already crowded urban centers of Bombay, Calcutta, and Delhi. As is often the case, the poor and disenfranchised suffer a disproportionate burden of India's environmental woes.

The work of litigator M.C. Mehta during the 1980s finally brought such environmental problems to the attention of the judiciary of India. Using existing laws and Constitutional provisions, solid litigation techniques, and a liberalized and respected judiciary, Mehta argued successfully a number of environmental cases before the Supreme Court.

Summary of the Law

The Constitution of India includes several provisions that directly or indirectly provide the basis for citizens to assert their environmental rights independent of other specific acts of law. Article 21 of the Constitution guarantees all citizens the right to life

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* This case study was written by Stephen Porter based on articles describing the public interest litigation reforms led by the judiciary, news accounts of the various cases described herein, and lectures given by M.C. Mehta, the lawyer that brought many of the seminal environmental law cases.

and liberty. In addition, the Constitution was revised in 1976 to incorporate a fundamental duty of all citizens "to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures."[11] Moreover, the Constitution requires the state to endeavor to protect and improve the environment.[12]

These Constitutional provisions alone were inadequate to provide any meaningful environmental protection or rights to citizens. That began to change in the mid-1980s when the Indian courts moved to liberalize access to the judicial process and strengthen the enforcement of Constitutional rights. Former Chief Justice Bhagwati was instrumental in pushing the judiciary towards reforms that enabled public interest litigation. This remarkable movement led by the judiciary extended its ability to address "substantial questions of social justice."[13]

To create this climate of judicial activism, the Indian courts made fundamental changes in four major areas.[14] First, they broadened traditional notions of standing to allow greater access to public interest litigants. As one court explained,

> "Test litigations, representative actions, pro bono publico and like broadened forms of legal proceedings are in keeping with the current accent on justice to the common man and a necessary disincentive to those who wish to bypass the real issues on the merits by suspect reliance on peripheral, procedural shortcomings ... Public interest is promoted by a spacious construction of *locus standi* ..."[15]

Second, the courts have adopted a flexible approach to procedural requirements. For example, a public interest action may be initiated by a formal petition or even by a letter or postcard to the court or a judge which the court may treat as a writ in the public interest. Third, the courts have adopted an expansive and activist interpretation of legal and fundamental rights to broaden the substantive scope of public interest actions. (The broadening of rights in the environmental context is discussed further below.) Finally, the courts have shown great remedial flexibility and have demonstrated a willingness to retain jurisdiction and supervise the ongoing response to orders and directives. This ongoing participation by the courts is particularly important in the environmental field, where solutions are often complex and require years to implement.

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[11] Const. of India, Part 4A, Art. 51A(g).

[12] Const. of India, Part 4, Art. 48A.

[13] These changes are detailed in Jamie Cassels, "Public Interest Litigation in India," 37 Am. J. Of Comp. L. 495 (1989) and Ayesha Dias, "Judicial Activism in the Development and Enforcement of Environmental Law: Some Comparative Insights from the Indian Experience," 6 J. of Envt'l L.243.

[14] The following discussion of PIL is drawn from Jamie Cassels, "Public Interest Litigation in India," 37 Am. J. of Comp. L. 496-507 (1989).

[15] Krishna Iyer J. in *Mumbai Kangar Sabhha v. Abdulbhai,* A.I.R. 1976 S.C. 1455 as quoted in Jamie Cassels, "Public Interest Litigation in India," 37 Am. J. of Comp. L. 495, 499 (1989). *Locus Standi* refers to the right to appear in a court of justice on a certain question.

Application of the Indian public interest approach to enforcement of Constitutional environmental rights was pioneered by one of the world's truly remarkable litigators, M.C. Mehta. Mehta has brought a series of public interest cases that have defined new environmental rights and brought about sweeping changes in the way business is done in India. In the process, the judiciary has become the institution in India with the most influence over the environment.

What Happened?

Mr. Mehta has brought a series of cases beginning in the mid-1980s that have put many sweeping environmental issues squarely before the Supreme Court of India. In fact, the Supreme Court now devotes every Friday to hearing environmental cases. The following summary of a few cases shows the breadth and power of India's judiciary in protecting the environment.

Protecting the Taj Mahal. In 1984, Mr. Mehta filed his first case seeking to protect the Taj Mahal from the effects of chronic air pollution. Ambient sulfur dioxide levels near the Taj were in the range of 300-350 micrograms per cubic meter, ten times the 30 mg/m^3 limit set by law. The elevated levels of sulfur dioxide were causing "marble cancer" on the Taj Mahal which deserved protection based on its status as one of the wonders of the world and a World Heritage Site. He also urged the court to act based on the precautionary principle in the absence of totally clear scientific evidence. Although the Supreme Court did not decide to hear the case until 1989, it ultimately acted decisively. In August 1993, the court ordered the closure of 212 industrial plants in the vicinity of the Taj. In March 1994, the court ordered the closure of an additional 11 plants near the Taj and instructed local authorities to provide 500 acres of land (far removed from the Taj site) to where some 652 industrial plants that posed a threat to the monument could be relocated. As evidence of the courts willingness to stay involved in this type of case, just recently the court ordered current and former high ranking government officials to explain why they had not carried out certain previous orders for the creation of a green belt around the Taj.

The Shriram Gas Case. The Shriram Gas case, decided in a series of landmark opinions in 1987 and 1988, involved a gas leak at a chlorine producing plant in Delhi. In requiring the plant to continue operations under a tightly controlled safety program, this case established several important precedents and is now a mandatory part of the curriculum in Indian law schools. First, the court established that the "right to life" contained in Article 21 of the Constitution encompasses the right to live in an environment free of pollution. This explicitly and significantly broadened the Constitutional protection of environmental rights. Second, the court established its willingness to retain jurisdiction over a defendant to ensure ongoing compliance with court orders. Third, it enunciated the proposition that to be effective, damage awards against major corporations must be of sufficient magnitude to have a deterrent effect, thus permitting an evaluation of the defendant's ability to pay in setting damage awards. Finally, the court articulated the theory of absolute liability for ultrahazardous activities

that are undertaken for profit. Under the doctrine of absolute liability, there can be no defenses to liability – not even an act of God.

The Ganges. Another massive and long-lived intervention by the court brought by Mehta is focused on the most sacred of Indian rivers, the Ganges. Throughout its 2500 kilometer length, the Ganges has been used as the dumping grounds for municipalities and industry alike to the point that worshipers bathing in the river were exposing themselves to health risks and massive fish kills were routine. When he initiated the litigation in the late 1980s, Mehta focused on only two industries. Now, however, there are over 100,000 parties to the litigation including riparian municipalities and industries ranging in size from the very small to multinational. The court has occasionally closed down egregious polluters, but more often imposes a compliance schedule on polluters who must then periodically report on pollution abatement progress to the court. The result has been steady improvement of the water quality of long stretches of the Ganges.

Environmental Education. Perhaps the most far reaching case Mehta has brought before the court was decided in 1991. Mehta argued that in order for the citizens of India to fulfill their constitutional duty under Article 51A to protect and enhance the environment, the government must ensure that the public is adequately educated on environmental issues. In other words, the Constitution indirectly imposed the duty to educate on the executive branch of government. To effectuate this duty the court ordered sweeping measures to ensure that environmental awareness is increased throughout India, the effect of which may not be fully understood for years to come. Specifically, the court ordered that every cinema, theater, touring cinema, and video parlor must show at least two environmental public service announcements or messages during each show to the public. Failure to comply will result in the loss of the facility's operating license. The Ministry of Environment is directed to produce the appropriate materials to be shown at the cinemas. Radio and television stations were directed to program at least five to seven minutes of environmental issues each day and to air more lengthy programs once a week. The court also ordered that the environment must be included as a compulsory subject in all grades from kindergarten through the end of high school. In addition, universities were required to introduce programs that focus on the study of the environment.

There have been dozens of other cases decided by India's courts on such issues as polluted ground water, the proliferation of shrimp farms in coastal areas, location of power plants near populated areas, and dust from stone crushing operations. In many of these cases, the court has enjoined certain activities, imposed operating conditions, or closed down particularly egregious polluters. Taken together, the cases suggest that not only are the Indian courts fulfilling the traditional judicial role of enforcing and applying the law, but they are also fulfilling environmental roles traditionally left to the executive branch. Thus, for example, the courts are imposing detailed and long-term regulatory schemes through the enforcement and oversight of compliance schedules. India's pollution and control boards, having largely abdicated their environmental enforcement

role, are being by-passed by the combination of citizen-based enforcement and judicial activism.

Did the Law Work?

The Constitutional provisions themselves had a minimal impact on the environment prior to the liberalization of the judicial system, and on the persistent efforts of lawyers like M.C. Mehta to broaden the application of those provisions to promote social justice and environmental interests. It is clear that the use of the public interest litigation system by Mehta and now others is having a profound effect on the behavior of industry and those charged with enforcing existing environmental laws.

Why Did the Law Work?

India has long had a judiciary that is widely respected throughout society and a rule of law that is widely accepted. These conditions make it possible for the judiciary to confront difficult environmental issues and force individuals, government agencies, and industry to incur the expenses associated with pollution abatement. Without societal respect for the judiciary and acceptance of the rule of law, the courts could not have become the force for environmental change that they have become in India over the past decade.

Perhaps because of the position they hold in society, the courts were able to transform themselves from the province of the elite and well-to-do into a populist forum for the enforcement of basic rights of citizenship. Public interest litigation could not have developed the way it has in India were it not for the willingness of the courts to broaden traditional notions of standing and to relax the procedural requirements necessary to bring a case before the bench. Furthermore, the broadening of substantive doctrines to include the right to live in an unpolluted environment and the right to receive information have given the courts extremely wide latitude in designing remedies and forcing behavioral changes on government and industry.

Another reason that the courts have been able to have such an impact on environmental policy is that they are the forum of last resort: India simply had no other alternative to address the mounting environmental problems it was facing. The other branches of government nominally responsible for environmental enforcement had failed to take effective action to reverse the course of environmental degradation. When other branches of government fail to fulfill their obligations to enforce environmental laws, it is often to the judiciary that citizens must turn to protect themselves from the effects of environmental deterioration.

Finally, it is unclear what effect the Constitutional provisions and transformed judiciary would have had in the absence of M.C. Mehta. It is rare in any country for a single individual to have the effect on the evolution of the law in a particular field that Mehta has had on environmental law in India. Not only has he brought before the courts

most of the groundbreaking environmental cases in the last decade, but his activities outside the courtroom have raised environmental awareness throughout the citizenry and inspired many others in the legal profession to dedicate their professional lives to environmental pursuits.

Lessons Learned

Ideally, citizens of India and other nations should never have to resort to Constitutional arguments to ensure that they are not harmed by environmental degradation. They should be able to rely on positive acts of the legislature and effective implementation and enforcement by the executive branch of their government. (Not to mention the primary responsibility of municipal and industrial actors to ensure that their operations are conducted in a manner that minimizes harm to the environment in the first place.) Unfortunately, that is not always the case, and reliance on judicial enforcement of broad constitutional doctrines or general statutory mandates may, as in India, become necessary.

One of the lessons from the Indian experience is the extension of human rights norms to include environmental components. The Supreme Court of India has construed the right to life guaranteed by the Constitution to include a right to an unpolluted environment. While this concept has been advanced in scholarly writings and some international instruments, it is rare that the right to a healthy environment is derived from the right to life and explicitly recognized and enforced by a national court system. While some national constitutions explicitly recognize the right to live in an unpolluted environment, virtually all guarantee the right to life. To the extent that the right to live in a healthy environment can be derived from the right to life, citizens of other countries may also be able to force changes in environmental behaviors where the executive branch of government fails to adequately address environmental degradation.

Another lesson is the importance of having a judicial system that is open to all citizens in fact and in theory. The willingness of the Indian courts to relax procedural requirements to allow ordinary citizens to bring actions and reach the substantive issues has been central to the success of public interest environmental litigation in India. For similar strategies to be effective in other countries, the relevant judicial system must be sufficiently open and accessible to ensure that public interest environmental cases are squarely and fairly heard. Similarly, the willingness of the judiciary to play an active role in directing the evolution of environmental policy is critical to the success of constitutional environmental litigation. Were it not for the Indian judiciary's recognition that nothing was or would be done to stem environmental degradation without its active and forceful participation in environmental affairs, the citizens of India would still not be protected from egregious environmental conditions.

Finally, although the reach of India's judiciary was facilitated by the wide law-making role traditionally provided courts in common law systems, the general lesson that citizen-based judicial enforcement can be an effective tool for environmental protection

extends equally to civil law systems. Many civil law systems have constitutional and legislative provisions that provide more than ample authority for a strong judicial role in environmental protection. [16]

[16] See, for example, the related case study on the Chanaral mining case in Chile in which the Chilean courts relied on explicit language in the Chilean Constitution that protects the right to live in an unpolluted environment. In addition, courts in Colombia have allowed for broad public access in environmental cases. Both Chile and Colombia have civil law systems.

Using Effluent Charges to Abate Water Pollution in Malaysia*

Introduction

Between 1960 and 1990, the palm oil industry in Malaysia grew from almost zero to over 6 million tons of oil production per year. This growth allowed Malaysia to become the world largest palm oil producer, accounting for half of world production and three-fourths of world exports by 1980, and served as an important part of the economic engine that powered Malaysia's growth during that period.

In addition to income, palm oil production generates an organic waste (POME) as a byproduct of processing palm fruits. A cluster of oil palm fruits must be harvested and processed as soon as it is ripe in order to produce palm oil.[17] Because mills require about one ton of water to process one ton of fresh fruit bunch, they tend to be located on watercourses. Due to the need to process the oil immediately, mills tend to be located near plantations, moderate in size and scattered throughout the country, as opposed to a few large mills in a centralized export point. Absent a treatment or other management system, POME is typically discharged into surface waters, where it threatens aquatic ecosystems by increasing Biologic Oxygen Demand (BOD) to almost anaerobic conditions. Ton for ton, the oxygen-depleting potential of POME is one hundred times greater than domestic sewage. The environmental impact of the rising POME discharge was aggravated by the fact that a relatively small number of major rivers drain most of peninsular Malaysia. Although the mills were dispersed, many were located on one of these rivers or their tributaries.

As Malaysia's palm oil industry grew, no treatment or management systems were devised for the POME byproduct. As a result of uncontrolled discharges directly into Malaysia's rivers, by 1975, the palm oil industry had become the country's worst source of water pollution. In that year, Malaysia's palm oil producers were discharging more than 1,000,000 tons of POME per day (the equivalent BOD load of domestic wastes from a population of more than 10 million people -- almost as large as the country's entire population) and, by 1978, this figure had increased by another 50% to more than 1,500,000 tons per day. By mid-1977, 42 rivers in Malaysia were so polluted that fresh-water fish could no longer survive in them -- largely as a result of uncontrolled POME discharges.

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* This case study was written by Junko Funahasi, based on an interviews with Professor Jack L. Knetsch, Professor, School of Economics and Resource Management, Simon Fraser University and Mr. Jeffrey R. Vincent at Harvard Institute for International Development. In addition, the author relied on "Getting Incentives Right: Economic Instruments for Environmental Management in Developing Countries" by Theodore Panayotou, Harvard Institute for International Development, Harvard University (1992), and Mr. Vincent's publication "Reducing Effluent While Raising Affluence: Water Pollution Abatement in Malaysia". The final text was edit by Eric Dannenmaier and Claudia Saladin.

[17] If left on the tree, they are devoured by rodents, birds, and other predators. If it is not harvested and processed the same day, the formation of free fatty acids spoils the oil.

By 1985 this trend had been reversed and POME was no longer Malaysia's main water pollution problem. This reversal was achieved through a mixed regulatory-incentive scheme, combined with research and development and key enforcement actions.

Summary of the Legal Mechanism

Malaysia's government responded to concerns over the palm oil industry pollution, and other growing industrial pollution problems, by passing an Environmental Quality Act in 1974. The Act created a Division (later Department) of Environment (DOE) and authorized it to require operating licenses for "prescribed" classes of industrial facilitates. These licenses could include conditions established by DOE based on:

- the practicality of adapting the existing equipment, control equipment or industrial plan to conform with the varied or new condition;
- the economic life of the existing requirement, control equipment, or industrial plant; and
- the estimated cost to be incurred by the licensee to comply with the revised or new condition.

The DOE was also authorized to vary the size of a license fee according to:

- the class of premises;
- the location of such premises;
- the quantity of wastes discharged;
- the pollutant or class of pollutants discharged; and
- the existing level of pollution.

Using this legislative authority, the DOE proceeded to develop a plan for regulating POME effluent from palm oil production facilities. DOE's first step was to create an expert committee, with representatives of both industry and government, to investigate possible treatment methods and technologies and to advise DOE on regulations that were "not only environmentally sound but also sensible within the framework of economic feasibility and available technology."

In July 1977, the DOE announced the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations. They established a regulatory system -- later modified as experience was gained -- that included the following key elements:

- Use of an expert committee to guide the initial regulatory process. While industry did not immediately accept the DOE's regulatory scheme, there is little doubt that the work of the expert advisory committee helped assure the technical soundness of the agency's ultimate approach, and helped assure both stakeholder interest in the

problem, and support for the solution. The committee operated for two years before any regulations were issued, during which time industry explored alternative effluent treatments used in other countries, and conducted laboratory research to refine adequate treatment methods.

- A licensing system requiring facilities to obtain annual operating licenses. The license applications needed to describe a facility's system for treating and discharging POME.

- Progressive license fees based on POME discharge size and BOD concentration, thus creating a system that increased the costs of a license for facilities with larger or more environmentally-destructive discharges.

- Quarterly reports describing the amount of POME discharged and its composition, based on tests by independent laboratories.

- Phased-in effluent standards based on eight technical parameters. Effluent standards for BOD, Chemical Oxygen Demand, total solids, suspended solids, oil and grease, ammoniac nitrogen, organic nitrogen and pH were established, and the DOE announced that it would make the standards increasingly stringent for four years, and that the stringency would be further increased even beyond the fourth year. For the BOD parameter, for example, facilities would be required to reduce BOD concentration in their effluent from 5000 ppm to 500 ppm from the first to fourth-year standards.

- Option to pay excess fee in lieu of meeting first generation effluent standards. This feature linked an excess license fee to the BOD load of a facility's POME discharge, and DOE set the excess fee at an amount that would encourage facilities to achieve the standard, without making the first-generation standard mandatory. This option was removed when the second-generation standards were issued, although the DOE's original plan was to continue the optional payment system.

- Research and development incentive. DOE allowed a partial or full waiver of effluent-related license fees to facilities conducting research on POME treatment.

What Happened?

During the first year the DOE was somewhat disappointed with the performance of the regulations. The average mill reduced its daily discharge of BOD from about 220 to 125 tons -- a disappointing, but nonetheless significant reduction. However, the DOE collected a substantial amount of revenue from license fees. Many mills chose to pay the excess fee rather than treat their effluent to meet the 5,000 ppm standard. A number of changes were made as the DOE responded to the results of the first year.

- Standards became mandatory. Beginning the second year, DOE removed the option to pay an excess fee in lieu of meeting the effluent standards. With the removal of this option, the standards became mandatory. DOE could now fine and ultimately cancel the license of any mill that violated the BOD standard. During the second year, the average mill reduced its daily discharge of BOD to 60 tons, half the level during the first year. Although this still did not match the DOE's expectation, the discrepancy between performance and expectation was much less than in the first year. The BOD load continued to decrease in the following years.

- Key enforcement actions were taken. Soon after the effluent standards became mandatory, DOE faced two cases of non-compliance with the standards. In the first case, DOE's threat to suspend the facility's license if it did not come into compliance within two months worked, and no further action was taken. In the second case, involving a mill on the Sungai River, mill owners had built huge holding ponds rather than installing a treatment system, and they ignored repeated warnings by DOE and threats to suspend its license. In October 1979, a dike around one of the holding ponds burst, and a nearby village was flooded with tons of partially decomposed effluent. The incident killed livestock, destroyed homes and led to public outcry and national publicity. Perhaps emboldened by the public outrage, DOE suspended the facility's license. Between 1981 and 1984, DOE took action against another 27 facilities.

- BOD standards were increased. A survey conducted by the Palm Oil Research Institute of Malaysia and the Rubber Research Institute of Malaysia (government established research institutions) in 1980-81 found that 90 percent of the 40 mills surveyed were discharging POME with a BOD concentration below the fourth-generation standard (500 ppm), and that 40 percent were discharging POME with a BOD concentration below 100 ppm. These findings and other evidence of ongoing improvements in treatment technology led the DOE to announce fifth- and sixth-generation BOD standards that called for even lower BOD levels. In 1991, three-quarters of crude palm oil mills complied with the sixth-generation BOD standard, and more than four-fifths complied with the other standards.

- Some standards were eliminated. In a concession to industry, the DOE eliminated the standards on COD, total solids, and organic nitrogen, which the survey revealed had proved difficult for the industry to meet.

- Alternative uses for POME were developed. The industry's ability to reduce its BOD discharge was facilitated not only by improvements in treatment technology but also by the development of various commercial byproducts made from POME. As early as 1977, a Danish company saw in the forthcoming regulations a market opportunity and began marketing to mills a process to convert separator sludge into animal feed. By 1982, ten large pig and poultry farms were using POME meal in their feed mixes. Mills that discharged POME onto land found that it had a fertilizing effect. This

enabled many plantations to eliminate their purchase of fertilizers, which saved one company an estimated M$390,000 per year. In 1992, three mills with tank digesters were recovering methane, which constitutes 60 to 70 percent of the gas generated during anaerobic digestion, and using it to generate electricity for mill use. The industry has discussed selling electricity generated from biogas to the National Electricity Board. In 1984, four mills found uses for all their POME and consequently had zero discharge.

Did the Legal Mechanism Work?

The goals and purpose of the Act and the regulations were to promote waste treatment facilities in the palm oil industry in order to improve the condition of public water bodies in Malaysia. The Act and the regulations have attained their goals: POME discharge was reduced from 1 million tons per day in 1977 to less than 8,000 tons per day in 1985; treatment systems are in place in every production facility in the country; and POME discharges are no longer the country's number one water pollution problem. In fact, the Act and regulations had tremendous success in changing the behavior of the palm oil industry and contributing to a cleaner environment.

However, the BOD standard is not the only cause of pollution of public water bodies in Malaysia. The DOE subsequently eliminated the standards on COD, total solids, and organic nitrogen, which the survey revealed had proved difficult for the industry to meet. The question remains whether the BOD standard was the best parameter to judge improvement of water quality.

Why Did the Legal Mechanism Work?

While no one element of the Malaysian approach can be identified as the source of the program's success, the combination of initial study and public dialog, a progressive license-fee system, phased-in effluent standards, research and development incentives and a few key enforcement actions led to dramatic results. POME discharges that had grown exponentially prior to the regulatory changes dropped even more dramatically under the new regime, even while the industry continued to grow. Malaysia's combination of providing research incentives while enforcing reasonable yet tough standards, coupled with a deliberate process of involving the regulated community appears to have been successful in addressing a serious environmental problem without destroying an industry that is no doubt important to Malaysia's economic development.

No study has analyzed which features of the regulations deserve the most credit for the massive reduction in the industry's pollution discharge. Were the innovative economic incentives in the regulations, such as the effluent-related license fees, the excess fees (in the first year), and the waivers for research expenditures, the key features? Or were the key features the more traditional, command-and-control aspects of the regulations, such as the mandatory standards (after the first year) and the DOE's

authority, and demonstrated willingness, to suspend or cancel licenses? Or was the key the combination of these features, a carrot-and-stick approach?

It is clear that over time, the regulations have taken on more of a command-and-control flavor. An obvious change is the switch from excess fees to mandatory standards. Less obvious is the erosion of the economic incentives due to inflation. The DOE has never revised the effluent-related license fees in the 1977 regulations.

Also, the development of new technology for utilizing POME must be recognized. It gave the palm oil industry an economic incentive to reduce their BOD discharge, because what their mills used to dispose of is now a commercial product.

Lessons Learned

This case illustrates the efforts to balance the protection of the environment and the economic interest of industry. It was a pioneer system for a developing country and despite its inefficiencies, the Malaysian mixed regulatory-incentive system did not result in loss of competitiveness for the Malaysian palm oil industry.

The political reason behind the government's decision to protect the environment, the first year's lenient regulation as well as subsequent enforcement actions, and the subsequent development of various technologies to utilize POME all contributed greatly to this successful outcome.

Using Coordinated Enforcement to Protect Forests from Illegal Logging in the Philippines*

Introduction

Fifty years ago, more than half of the Philippines' 30 million hectares of land area was old growth tropical rain forest. By 1988, satellite imagery indicated that only 800,000 hectares of the virgin forests remained – the millions of other hectares of forest being victims of illegal commercial logging and the slash and burn farming that follows in the wake of illegal logging.

In the 1980s, five critical regions were identified: four regions covered with virgin forests that were still subject to large-scale felling, and additional regions that served as marketplaces for illegal forest products. The regions containing significant virgin forest resources included: the north-eastern Province of Isabela, the eastern seaboard Province of Samar, and the south-eastern seaboard Provinces of Surigao and Agusan. Adjoining provinces were also identified as critical areas – not because they contained virgin forests but because they served as markets for illegal forest products.

The population was mostly indifferent to the decline in virgin forest areas. Those who were concerned felt generally helpless, as the perception was that powerful politicians and military personnel were behind the illegal logging operations. In addition, people felt that the Department of Environment and Natural Resources (DENR), which is charged with oversight of the nations forests, was also a part of the problem. The perception was that illegal logging could not occur without the cooperation of DENR personnel. However, a closer look at the situation revealed that the forest rangers and other DENR personnel actually had little choice. In the milieu that they were working, they were forced to cooperate with wealthier groups. If they did not cooperate, they faced either transfer to another region or threat to life and limb. Moreover, such cooperation served to supplement their meager monthly income.

Although there were laws designed to control and manage the harvesting of timber, economic incentives facilitated the erosion of the reserve of virgin forest resources. Forestry (legal and otherwise) was the primary source of livelihood for many communities. Until 1992, there were only a handful of convictions for violations of the

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* This case study was written by Antonio A. Oposa, Jr., an environmental lawyer from the Philippines. Mr. Oposa participated in the preparation and implementation of the forestry enforcement project. The description of events in this case study are based on his first-hand experience. He would like to give credit to the men and women who dared to uphold the law: NBI Agent Oscar Embido; DOJ Senior State Prosecutor Severino Gana, Jr.; DENR Regional Director Leonardo Paat; Former DOJ Undersecretary Ramon Esguerra; Former DENR Secretary Angel Alcala; Former Supreme Court Deputy Administrator Juanito Bernad; UP-IJA Director Prof. Myrna Feliciano; NBI Agent Ludgi de Lemos; DOJ State Prosecutor Reynaldo Lugtu; and the scores of men and women who battled against the odds, gave their time and risked their lives in defense of Nature.

forestry laws. Hardly any of the worst offenders were ever apprehended, much less prosecuted.

This case study focuses on the efforts of a group of men who sought to utilize the law to reduce the environmental damage done by illegal logging. It describes in detail the effort to create a 'legal army' made up of personnel from different agencies of government which were critical in the effective enforcement of forestry laws. The unique quality of this group is that its factions were not united in a single common cause, but rather wanted to address separate, though related, forestry issues. This case study details a massive law enforcement campaign that, at the very least, exhibited the political will to curb illegal logging.

Summary of the Legal Mechanism

Since 1975, the Philippines has had a comprehensive law on Forestry (Presidential Decree (PD) No. 705). The law and its regulations are voluminous and detailed. The law provides that:

> "Any person who shall cut, gather, collect or remove timber or other forest products from any forest land without any authority under a license agreement, lease license or permit, shall be guilty of qualified theft ... In case of partnership, association or corporation, the officers who ordered the cutting, gathering or collecting shall be liable ..." (Sec. 68, PD 705)

The law was extremely difficult to enforce because, for all practical purposes, it was next to impossible to apprehend persons in the middle of the forest. Consequently, the point of contact was usually in the highway where the forest products were being transported and in the milling stations and lumber yards where the forest products were being readied for the market. Thus, Executive Order 277 (1987) made mere possession of illicit forest products an offense punishable as qualified theft.[18]

As described below, criminal procedures allowed for inquest proceedings in the field. When a person has been apprehended in the act he may be subjected to an immediate, on-the-spot hearing to determine probable cause and to temporarily detain violators pending release on bail.

In 1990, a major law enforcement campaign, called the Monitoring and Enforcement Component, was launched with funding from the World Bank,. As part of this enforcement campaign, a forestry enforcement project was prepared and implemented. Following the election in 1992, a new Secretary of the DENR was appointed.

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[18] This was enacted while then President Corazon Aquino exercised legislative powers prior to the elections of Congress.

What Happened?

The August 1992 Raid. The first phase of the project was to test the provisions of the law and applicable criminal procedure. It was necessary to send a message to the illegal logging community that the law can be used against big-time offenders, and that the law could be applied in a swift and painful manner. Consequently, a raid was planned in Region IV, a known market and milling center. The initial raid was aborted due to an information leak, and a second raid was planned which allowed more time for preparations.

A team of dedicated and experienced officials from the Department of Justice (DOJ), the National Bureau of Investigation (NBI) and the DENR was assembled. To document and publicize the effort, a photo-journalist was invited to join the team. This would be the first time this type of team had been organized for the sole purpose of apprehending criminals behind the illegal forestry operations rather than merely intercepting the illegal logs and forest products. For security reasons, the legal team had to be small, mobile and hand-picked. This team was part of a bigger team of the DENR that was to conduct surveillance in Butuan City and included a light plane. The specific objective was known only to the Legal Team Leader, the DOJ and NBI.

To ensure that the raid would be legal, the team secured a special order from the Secretary of the Department of Justice authorizing the travel and participation in the conduct of operations by its personnel. To ensure secrecy in the event a search or arrest warrant was necessary, the Deputy Court Administrator of the Supreme Court prepared a letter addressed to the concerned judges of the Region introducing the team, the team leader, and the team's mission. Upon arrival, the team coordinated with the local courts and the DOJ Prosecutor's Office to ensure their availability at all times in case the operation occurred during the night.

Late in the afternoon of August 13, 1992, the surveillance team spotted presumably illegal logs floating in the river at the back of a large plywood factory. The Legal Team was mobilized into action.

Security guards bearing shotguns guarded the factory compound. It was important that the team also exhibit a show of force to prevent the guards from resisting and thereby avoiding violence; overpowering force is essential to foreclose even an attempt to resist. Thus, in coordination with the local Military and without disclosing the Team's intention, a squad of battle-uniformed soldiers, armed with Armalite rifles and rocket launchers, was secured as a back-up force.

Once the team verified that the suspected logs were in fact illegal, the team dispatched the local investigating prosecutor to the plywood factory's compound. Then and there, the team commenced inquest proceedings under the direction of a street-smart member of the Legal Team, State Prosecutor Reynaldo Lugtu. Before the formal

proceedings began, the persons arrested – the General Manager, the Assistant General Manager, and the Procurement Officer – called for their counsel who arrived and asked for the team's 'authority.' At this juncture, the team showed the counsel their 'authority' – the Special Order from the DOJ Secretary.

Before midnight and barely six hours from the start of the operation, the corporate officers arrested were in jail. For the first time in the history of Philippine natural resources law enforcement, top officials of a logging company were arrested, subjected to an inquest, and jailed. Instead of the inquest being conducted in the Office of the Investigating Prosecutor, it was conducted in the field, in this case, at the sawmill.

Institutional Cooperation. Prior to this campaign, one of the chief complaints of DENR personnel was the lack of understanding and cooperation from other concerned institutions that resulted in frequent dismissals of illegal logging cases. The success of the August 1992 raid demonstrated the benefits of agency cooperation, and pointed to the need to institutionalize the arrangements to ensure the success of ongoing enforcement efforts. This was accomplished through the use of a series of Memoranda of Agreement (MOAs) between relevant agencies and judicial offices. The MOA process was designed to enlist the personal support of the concerned agencies and to educate them on the intricacies of forestry law enforcement. The critical agencies were the Department of Justice, the NBI and the Courts of Law. The inclusion of the NBI was essential because it is the most credible of the law enforcement organizations in the Philippines. Memoranda of Agreement were crafted by the DENR as well as the DOJ, Supreme Court and the NBI.

Creation of the National Steering Team. One major weakness of previous law enforcement efforts that the forestry enforcement project sought to remedy was that once a case was filed, the different agencies, including the DENR personnel, would lose initiative or become subject to undue and extreme financial or political pressures. This was done by creating a National Steering Team (NST) composed of senior members of the various governmental organizations with jurisdiction over illegal forest activities. The NST closely monitored enforcement efforts in the various regions. The NST would convene the local DOJ, DENR, NBI, Police and Judges, and NGOs in a day-long meeting in their respective locales, rather than in the air-conditioned comfort of offices and hotels in Metro Manila. These meetings would run through each and every pending case and determine the status by inquiring from all the concerned parties. They served to acquaint NST members with the problems in the field. Being high-ranking in their respective departments (DENR and DOJ), the NST members would be in a position to immediately address any problems encountered. Through the meetings, field personnel would be kept on their toes knowing that the higher-ups are watching and monitoring the flow of the cases. In addition, field personnel would develop the confidence to resist and have a convenient 'scapegoat' when being subjected to social or political pressures. They could easily point to the fact that the NST was monitoring every step of the way and that they would be held answerable in public for any mishandling of the cases. Above all, the NST

was meant to deliver the message that the government was serious in its efforts to curtail illegal logging.

Did the Legal Mechanism Work?

The success of the effort to enforce the forestry laws may be classified in two ways: the legal operation, and the overall effort to coordinate the actions of the concerned institutions.

The legal operation was meant to deliver the message that the law can be used to administer swift and decisive justice. To the extent that several agencies of government, cooperating with the media and NGO elements, were able to coordinate their activities and launch a massive operation with almost surgical precision was, in itself, an accomplishment unprecedented in the history of environmental law enforcement in the Philippines. That prominent persons were arrested and charged was by itself a singular achievement. Indeed, the law can be made to work when a few key people are determined to make it work. Creative application of the law can achieve the desired end of sending a message.

With respect to the total effort to educate the concerned agencies and to coordinate their functions, the statistics on the rate of convictions tell a compelling story. Since July 1995, 180 convictions for forestry law violations have been recorded. Virtually no violations were recorded prior to 1992.

To be sure, the legal enforcement effort has suffered numerous setbacks. Certain prominent suspected violators were eventually acquitted on technicalities and other reasons. For example, the suspected violators in the first Butuan raid (where inquest proceedings were held in the field) were acquitted on reasonable doubt. The law requires that for corporations, the officials who ordered the possession or cutting be held liable. In practical evidentiary terms however, it is next to impossible to prove, for example, that the General Manager actually ordered the cutting or the possession of illegal forest products. The law needs to be amended to the effect that the General Manager or other responsible officer, being in control of the firms' operations, shall be presumed to have ordered the illegal operations.

In the end, it is noteworthy that many who violated the forestry law were prosecuted. The fact that the number of convictions has escalated is a credit to the men and women who dared to uphold the law.

Why Did the Legal Mechanism Work?

The MOA process contributed significantly to the success of the forestry enforcement project, by facilitating the interagency cooperation necessary to carry out the raids and follow through on the enforcement actions. Another major factor in the success of the enforcement projects was the creation of the NST. By creating a coordinated

mechanism for monitoring enforcement efforts throughout the country, the NST was able to address the problem of undue influence on local officials charged with forestry enforcement.

Media attention was also important to the success of the enforcement effort. The success of the operation was publicized in order to send a message to those who profited from the illegal timber trade -- the government was now committed and able to enforce the forestry law. The publicity also served to help solidify popular support for the forestry law enforcement effort. Although there are few statistics to prove it, it is reported that this single operation dramatically reduced illegal forest products trade in the area. The operation unquestionably showed that given cooperation by the various agencies concerned, illegal logging operations can be raided and shutdown.

Lessons Learned

To strengthen the enforcement effort, the delivery of swift and substantial penalties must be coupled with maximum publicity. If law enforcement is to serve as a deterrent, those that violate the law must be aware of the consequences. The raid on the plywood factory in August 1992 and subsequent air, land, and sea raids conducted in June and July 1993 in other critical areas of the country (code named Oplan Jericho) received wide-spread media coverage. The broad media coverage ensured that others in the illegal logging community were aware of the increased enforcement efforts. In addition, the media coverage raised public awareness of the extent and environmental consequences of illegal logging. Oplan Jericho could, perhaps, be considered the turning point of public awareness in the campaign against illegal logging in the Philippines. Unfortunately, many subsequent phases of the enforcement campaign gained no publicity at all. Because of the lack of preparation and budget in this aspect of the operations, certain scenes that would have delivered a dramatic impact were not recorded in still or in moving pictures: rappelling down from a helicopter in the middle of the sea to arrest a boat, the airborne landing team in Isabela, and the bold breaking of doors in Butuan. In addition, the NST follow-up meetings did not receive any media coverage.

This narrative focuses solely on the legal enforcement effort. Law enforcement cannot exist in a vacuum. It must not only be supported by governmental authority, but also by the local community and the public at large. This is possible only when the community is sufficiently aware of the importance of the campaign and is ready to support it. Educating the public on environmental issues is another reason to why media coverage is so important. Publicizing environmental campaigns and enforcement actions can provide a valuable opportunity to educate the public.

Another lesson to be learned is that in a highly personalistic society such as the Philippines, institutional efforts must be coupled with the development of personal relations by and among the players. There needs to be a 'champion' who has the leadership qualities and charisma to rally the different forces of government. He or she can be an NGO member, or better yet, a person who is clothed with official authority. If

that champion is gone, the institutional efforts are bound to falter. With a new management team at the helm of the DENR, a meeting between the Secretary and the Legal Team (of the DOJ, NBI and the Office of the Solicitor General) is being arranged. Hopefully, the DENR Secretary can now assume the lead, and, with official authority in his hands, make things move forward.

Using Selected Criminal Enforcement to Protect the Integrity of Environmental Reporting Data in the United States*

Introduction

Pesticide regulation in the United States relies heavily on data generated by the regulated community and delivered to the Environmental Protection Agency (EPA) for review. As with other forms of regulatory self-reporting, the effectiveness of the entire regulatory system depends on the veracity and accuracy of the data provided to EPA. In order to help guarantee the validity of this data, various provisions of U.S. law impose criminal liability on those who generate data that is false or generated in a manner that is not consistent with accepted scientific practice. This case study focuses on one egregious example of falsified data by Craven Laboritories, Inc. that was used to support industry submissions to the EPA, the decisive response of federal law enforcement officials, and the reaction within the regulated community. The combination of cooperation from industry employees and the meticulous work of a team of lawyers and scientists led to a prosecution.

Summary of the Legal Mechanism

In order for a pesticide to be marketed or used in the United States, it must first be "registered" by EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).[19] In addition, before a registered pesticide may be used on food crops, the manufacturer or supplier must seek and receive a "tolerance level" from EPA under the Federal Food, Drug, and Cosmetic Act (FFDCA) which sets the maximum amount of pesticide residue that may remain on or in foods meant for human consumption. Under the FFDCA, a food containing a pesticide for which no tolerance has been established or at levels in excess of the established tolerance level is considered adulterated. Adulterated foods may not be offered for sale and are subject to the enforcement mechanisms of the FFDCA.

In summary, the process works as follows. The EPA sets criteria for the type of information that must be submitted to support an application for registration of a chemical (or for issuing a tolerance level for agricultural uses). The sponsor or registrant must then generate or gather the data that EPA has required. The data may be generated

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* This case study was written by Stephen Porter and is based on the criminal complaint filed in the case, contemporaneous press releases from EPA, news accounts, discussions with Assistant US Attorney Jim Howard, who prepared the government's case, and EPA enforcement officials.

[19] EPA is in the midst of a re-registration process under which even those chemicals that were registered long ago under previous versions of FIFRA must submit to the same registration process as new chemicals. This process was mandated by the Congress and reflects the fact that the evolution of scientific knowledge now allows more sophisticated and accurate testing and evaluation of chemicals than was possible even ten or twenty years ago. Thus the data submission process described below applies not only to new chemicals but to existing chemicals as well.

in a number of ways: the sponsor may generate some or all of the data in-house; some studies may be farmed out to independent testing laboratories; or if another registrant has submitted data on the same chemical, the sponsor may rely on that data (and provide compensation to the other registrant). Sometimes, multiple sponsors seeking to register or establish tolerances for the same chemical will form a task force and share the costs of generating the necessary data for EPA. As the studies are completed, they are submitted to EPA for evaluation and ultimately a decision on whether to register the chemical or approve tolerance levels for use on particular food crops.

The federal laws of the United States contain a number of provisions that impose criminal sanctions for fraud or misrepresentation. The more common provisions are designed to prevent the use of the US mail in furtherance of a fraud,[20] the making of false statements,[21] and obstructing federal agency proceedings.[22] In addition, a number of environmental laws that include some form of self-reporting or submission of data to EPA also impose criminal sanctions for failing to do so or doing so in a fraudulent or misleading manner.[23]

The purpose of these provisions is to reduce the amount of fraud generally and specifically in the dealings of private parties with the federal government. The anti-fraud provisions of the environmental laws specifically seek to ensure that the reliance on self-reporting and data submission are not undermined by those seeking to evade regulation by falsely reporting information that indicates compliance with applicable regulations, when in fact they are not in compliance. Without the threat of criminal prosecution and sanctions, there would be little incentive to comply with the requirements of self-reporting or data submission regulatory schemes. It should be noted that the anti-fraud provisions of environmental laws overlap to a large extent with the general anti-fraud provisions of the US Code. Thus prosecutors may have a choice of laws under which to prosecute individuals or corporations suspected of abusing self-reporting or data submission requirements.[24]

In addition to the criminal sanctions imposed on those who generate and submit false data (or withhold damaging data), EPA seeks to ensure consistent and honest test results by imposing Good Laboratory Practice (GLP) standards on labs doing work for

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[20]18 U.S.C. § 1341.

[21]18 U.S.C. § 1001.

[22] 8 U.S.C. § 1505.

[23]FIFRA, for example, specifically forbids falsifying pesticide data, forbids the knowing submission of false data, and imposes criminal fines of up to fifty thousand dollars and up to one year in jail for violations. 7 U.S.C. § 136j(a)(2)(Q) and (R) and § 136l(b). Likewise, the Clean Water Act explicitly forbids the making of false statements regarding matters in the statute and imposes criminal fines of up to ten thousand dollars per day of violation and two years in jail. 33 U.S.C. § 1319(c)(4). Some have criticized the penalties imposed under FIFRA as being inadequate to alter corporate behavior.

[24]In fact, prosecutors may well prefer to charge suspected wrong-doers under the more general statutes since there is a well developed body of case law upon which the can draw in doing so. Moreover, the general fraud provisions may impose greater penalties and thus produce a greater deterrent effect.

submission to EPA. The GLP program requires minimum standards be met regarding record keeping, personnel, and laboratory equipment. In addition, the EPA Office of Compliance Monitoring conducts laboratory and field site inspections and audits the raw data of studies submitted to EPA. As part of the GLP program, for each study submitted to EPA, the lab conducting the tests must certify that all tests have been conducted according to the GLP standards. The purpose of these measures is to ensure that data generated for submission to EPA is the product of good and consistent scientific methods.[25]

What Happened?

In order to fulfill their obligations under FIFRA and the FFDCA, a number of large agro-chemical manufactures formed a task force to gather the necessary data to submit to EPA to establish tolerance levels for pesticides they sought to market. To generate part of the necessary data, the task force hired Craven Laboratories, Inc. (Craven), a Texas based independent testing lab. Craven conducted a number of tests and generated data and reports summarizing the results for the task force. These data and reports were in turn forwarded to EPA to support the establishment of the requested tolerance levels.

Unbeknownst to the task force and EPA, Craven had perfected various ingenuous methods for fraudulently producing seemingly legitimate test results. In part Craven was motivated to falsify results due to time and economic pressures that made it impracticable to redo from scratch tests that failed to produce scientifically valid results. By using these laboratory tricks, Craven was able to produce data that looked to be clean and consistent, in short, just the way the studies' sponsors would want it to look. In doing so, Craven kept two distinct books to chronicle the test results; one that recorded the actual results and one that recorded the faked results.

The faked data produced by Craven went undetected until a Craven employee blew the whistle on the operation. The employee first raised the issue that some of the test results were being faked with members of the task force, which in turn notified the EPA that some of the data submitted to support their application for a tolerance level may have been falsified by Craven. An initial three-day inspection of Craven's operations by the EPA inspectors (following two weeks notice and several days of delay wrangling with Craven's lawyer) produced no evidence of any misconduct. Only when EPA's criminal investigators took over and conducted an unannounced raid on Craven's offices and records storage shed armed with a search warrant, guns, badges, and the power to threaten employees with prison did EPA uncover evidence of Craven's pattern of falsifying data.

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[25]It is worth noting, however, that the GLP program did not detect the falsifying of data that was done at Craven Labs. In fact, even after a former employee blew the whistle on Craven, the initial inspection by EPA over a three day period failed to detect any wrongdoing. Only a later, more aggressive investigation complete with search warrants unearthed evidence of the falsified data.

The government put together a task force of lawyers and scientists to prepare the case against Craven and four top officials of the company. The task force spent over two years and a million and a half dollars to bring indictments. In doing so, government lawyers struck deals with a number of Craven's lower level employees to get their cooperation in exposing the extent of Craven's fraud.

Ultimately, the principle defendants pled guilty to numerous charges of conspiracy, mail fraud, false statements and concealing material facts, and obstructing agency proceedings. Ultimately, fourteen employees received fines or jail time; Craven owner, Don Allen Craven, received a five year sentence and the company was fined over fifteen million dollars reflecting the cost to the government of preparing and prosecuting the case and the cost to Craven's former clients who had to redo the Craven studies for submission to EPA.[26]

Did the Legal Mechanism Work?

The ultimate effectiveness of the prosecution of Craven Labs, Inc. is an open question. On the most basic level, the investigation and prosecution of Craven brought to an end any falsification of EPA pesticide data by that particular lab. The principals have been jailed, enormous fines have been levied, and the lab is out of business. It is more difficult to draw any definitive conclusions, however, on the broader issue of whether the prosecution of Craven has eliminated or significantly reduced the level of fraud in the generation and submission of pesticide test data to EPA. However, the Craven case was widely reported and followed within the agricultural chemical industry, and is likely to have had a strong deterrent effect on major chemical manufacturers.

The less clear cut area of concern is the effect on independent testing laboratories that conduct a significant portion of the work required to support registration and tolerance applications to EPA. These labs do not have the same public accountability concerns as do the chemical manufacturers and thus face a significantly different set of incentives (or disincentives) when it comes to the validity of the data they produce. Nevertheless, as a result of the Craven Labs case the independent testing labs have come under increased scrutiny by the EPA's Office of Compliance Monitoring and face greater pressure from their clients, the chemical industry, to adhere to Good Laboratory Practice standards.

Why Did the Legal Mechanism Work?

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[26]The Craven case is not the only time a lab has been caught and prosecuted for conducting and submitting falsified data to EPA. In the early 1980's, Industrial Bio-Test Laboratories, Inc. And several of its senior managers were convicted of various counts of fraud and false statements in connection with toxicology studies it conducted in the 1970's to support a pesticide registration application. United States v. Keplinger, 766 F.2d 678 (7th Cir., 1985)(upholding convictions on appeal). The falsified data and laboratory mismanagement went far beyond that detailed in court, and resulted in the institution of EPA's GLP standards and compliance monitoring efforts. See, e.g., Jeff Trewhitt, "Chemicals Survive Testing Scandal ... Amid Criticism," p. 19, Chemical Week (Oct. 17, 1983).

The Craven Labs case demonstrated the weaknesses of EPA's GLP enforcement efforts. EPA officials frankly admitted that they would never have uncovered Craven's fraudulent data generation practices were it not for the willingness of the former Craven employee to come forward and initially expose the fraudulent practices. Even after EPA had been tipped off, uncovering the fraud was not a simple matter, as indicated by the fact that the initial inspection failed to do so.

Criminal prosecution of those who produce and submit fraudulent data is likely to improve the quality of data submission and self-reporting generally for a number of reasons. The possibility of jail time and substantial fines provide an important incentive to adhere to the honor system inherent in data submission and self-reporting regulatory schemes. Such "costs" as fines and potential jail time change the economic calculus of whether or not to comply with the letter of the law in favor of compliance. In addition, fines and jailing of dishonest principals can serve to put organizations, like Craven, that seek to exploit the self-regulatory system out of business, thus reducing the number of dishonest players.

The stigma of being found guilty of criminal behavior is perhaps more significant than the economic threat of fines since it can do irreparable harm to an individual's or corporation's "good name." The large chemical companies involved in manufacturing and selling agricultural chemicals are highly sensitive to their public image and feel that they must overcome the public's general antipathy to chemicals.[27] They are unlikely to risk criminal sanction for in-house testing work since the public relations damage of such a prosecution would be serious. Moreover, anecdotal testimony to the effect of criminal prosecutions for environmental transgressions generally suggests a preventive aspect. Attorneys for corporations have candidly admitted that such prosecutions have made the job of advising their clients to adhere to the letter of the law easier. It seems that the threat of a criminal conviction and possible jail time has an easily understood effect on corporate managers in a more immediate way than the threat of civil or administrative sanctions.

Another way to view the Craven case is in a longer-term perspective. Just as the Industrial Bio-Test Lab case from the early 1980s led to the introduction of the GLP system at EPA and resulted in greater resources being allocated to ensuring compliance, the Craven case has led to a tightening of compliance enforcement by EPA. It is a function of human nature, however, that over time the commitment to enforcement is likely to wane as other issues replace data fraud on the regulatory radar screen.

Lessons Learned

While the use of industry data submission in support of federal pesticide

[27]It is interesting to note that the agro-chemical industry trade association has changed its name from the National Agricultural Chemical Association to the American Crop Protection Association.

regulatory efforts involves significant efficiencies and relieves government of the burden of having to conduct tests itself, the experience of the United States with this system indicates that the federal authorities must have the legal authority and resources to ferret out and punish cheaters or the integrity of the entire system collapses. Likewise on the broader level, environmental self-reporting can save the federal authorities significant time and resources while imposing relatively minimal costs on the regulated industry. However, for such systems to function properly, the information received by the government must be reliable. Because such data fraud is often difficult to detect, even when there is a whistle-blower, aggressive enforcement is required when fraud is detected. Both substantial fines and criminal sanctions must be available to the authorities when fraudulent data is provided.

Fines imposed on cheaters must be significant. Given the difficulty of detecting fraud, the economic costs of getting caught must be high enough that the costs of living within the letter of the law seems more attractive than running the risk of getting caught for fraud.

The additional option of criminal sanctions is necessary because industry may choose to treat civil or administrative fines as merely the cost of getting caught -- an incidental business expense. The only way to ensure its reliability is to aggressively pursue and punish those who give in to the temptation to "beat the system" by falsifying submissions to the authorities, especially in the case of egregious violators.

Using the Toxic Release Inventory to Reduce Toxic Emissions in the United States*

Introduction

Many countries around the world share the burden of toxic chemical contamination of their environments. In the fifty years following World War II, the use of toxic chemicals has increased tremendously, with 100,000 different commercial chemicals utilized in a wide variety of industrial and manufacturing applications, both large and small, all over the world.[28] In the United States alone, over 70,000 chemical substances have been placed in commerce over the past fifty years, involving nearly 200,000 different facilities.[29] Annual US production of these chemical compounds has been estimated to be in excess of 6 trillion pounds.[30] These substances are used in the manufacturing of plastics, electronics, pharmaceuticals, and a host of other products associated with our increasingly complex society.

As a result of their increased use, large amounts of toxic chemicals have been released into the air, water, and land. Man-made chemicals have been found in plant and animal species on every continent. New studies continue to show linkages between exposure to toxic chemicals and damage to both the environment and the wildlife and human inhabitants it supports.[31] Serious human health problems such as cancer and neurological and reproductive disorders have been attributed to toxic chemical exposure. But until recently, the public remained largely unaware of the invisible dangers they have been subject to from the manufacturing, storage, and release of toxic substances in their own neighborhoods.[32]

The accidental release of methyl isocyanate from a Union Carbide plant near Bhopal, India in December of 1984 changed the public's view of the chemical industry almost overnight. Over 3,000 people were killed and as many as 200,000 more injured when methyl isocyanate gas escaped from a Union Carbide chemical plant, making it the worst industrial accident ever.[33] In the aftermath of the Bhopal accident, the chemical industry came under intense public scrutiny. In the United States, the public demanded

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* This case study was written by Gary Cook of CIEL and is based on interview with Carolyn Nunley at INFORM Inc., Tom Natan at Hampshire Research Institute, and D.B. Redington at Monsanto. In addition the author relied on the publications: *Toxic Watch '95* by Inform Inc., *The Right Stuff: Using the Toxics Release Inventory*, and *The Right to Know: The Promise of Low Cost Public Inventories of Toxic Chemicals* by WWF.

[28] World Wildlife Fund, *The Right to Know: The Promise of Low-Cost Public Inventories of Toxic Chemicals* at viii (1994).

[29] *Toxic Watch 1995* at 4.

[30] *Id.*

[31] World Wildlife Fund, *A Benchmark for Reporting on Chemicals at Industrial Facilities* 2 (1995).

[32] *Id.*

[33] *Is it Possible to Know too Much?*, The Washington Post, June 14, 1988, at 14.

that the chemical industry open their operations to the public and disclose the type and amount of toxic chemicals used and released at each facility. This case study examines how a law which armed the public with environmental information prompted major changes in industry's attitudes toward toxic chemical emissions.

Summary of the Legal Mechanism

Within two years of the accident at Bhopal, the US Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA), as part of the Superfund Amendments and Reauthorization Act of 1986 (SARA).[34] EPCRA is meant to assist local authorities in planning for chemical emergencies and to provide both the government and the public with information about potential chemical hazards from chemicals used and released in their communities. To develop the information needed to develop emergency response plans, EPCRA directed the US Environmental Protection Agency (EPA) to compile a Toxic Release Inventory (TRI), an annual inventory of toxic chemical releases and transfers made by US manufacturing industries. EPA was directed to make the data from the TRI reporting available to the public in a computerized database.

TRI, a form of a Pollutant Release and Transfer Registry (PRTR), is based on the idea that citizens have a right to know of the existence and release of potentially harmful substances into the environment in which they live. The TRI program requires only that facilities report the amount of each toxic chemical released or transferred. It does not require that the use of the chemical be curtailed or its emissions reduced. Despite its limited role, many viewed TRI as a crucial first step in understanding the threat toxic substances pose to our environment. Existing federal statutes did not regulate many toxic chemicals at all, while other toxic chemicals were subject only to a "Best Available Technology" standard. With the exception of a select few states, information on toxic releases was quite limited prior to the development of the TRI database, even for government and industry officials. TRI marked the first time information on the type and total amount of toxins released was to be collected in a centralized database.

TRI, as set forth under §313 of EPCRA, requires "owners and operators of facilities with ten or more full-time employees and that are in Standard Industrial Classification Codes 20-39 and that manufactured, processed, or otherwise used" a listed TRI chemical beyond the threshold amount to submit an annual TRI report to EPA.[35] Facilities within this coverage include, among others, chemical manufacturing, petroleum refining, rubber plants, and paper mills. Threshold use of TRI chemicals is 25,000 pounds (US pounds) for chemicals manufactured or processed and 10,000 pounds for toxic chemicals otherwise used.[36]

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[34] Emergency Planning and Community Right-to-Know Act of 1986, 42 USC § 11001 to 11050.

[35] 42 USC § 11023 (b)(1)(A).

[36] 42 USC § 11023(f).

As originally enacted, EPCRA required qualifying facilities to submit an annual report detailing the amount of the 320 listed toxic chemicals released into the air, water, land, or disposed of through underground injection.[37] Qualifying facilities must also disclose in their report chemicals transferred offsite for disposal or treatment. Companies are required to break their releases and transfers down by category in their report: Air Emissions – intentional point source and fugitive emission; Releases – On-site releases, underground injection, and surface water discharges; and Transfers – Off-site transfers or transfers to public sewage systems. Source Reduction was added as a reporting category by the Pollution Prevention Act of 1990, requiring facilities to report techniques used in reducing amount of TRI chemicals produced.[38]

Once the TRI have been submitted, the EPA compiles these reports into computer database files that can be downloaded by the public. These files summarize and breakdown the TRI data according to media category, off and on site transfer category, accidental releases, and on-site energy recovery. The TRI data are sorted by chemical, state and industry, and also ranked for the top 50 chemicals, top 50 facilities, top 10 parent companies, and top 50 counties. For reporting years beginning with 1989, EPA also provided comparisons of previous years data by chemical, industry, state, and the top 50 facilities in terms of percentage change in increase or decrease.

What Happened?

At first, many did not expect TRI to initiate significant emissions reductions or changes in production manufacturing and design. Although its proponents maintained that TRI would spark revolutionary change in the way in which we approach toxic emissions, many others felt that while citizens of certain communities would be surprised to learn of significant toxic releases from nearby plants, the chemical industry would be able to manipulate the TRI data in order to reduce public concerns.[39]

EPA released the initial 1987 TRI reporting data in the summer of 1989, detailing the release of over 10.3 billion pounds of toxic material by US facilities. The magnitude of these figures surprised almost everyone, with the 1987 TRI report showing reported releases over ten times what had been estimated previously.[40] For example, toxic air emissions, which had been estimated to be approximately 80 million pounds, under the 1987 TRI data, were shown to be approximately 886 million pounds annually.[41]

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[37] The original list was largely based on the reporting requirements of the existing TRI programs in Massachusetts and New Jersey. Under EPA's Phase 1 expansion of TRI, another 330 toxic chemicals were added, bringing the total number of TRI chemicals to 650.

[38] See generally, EPCRA § 313 and Pollution Prevention Act §6607.

[39] *Is it Possible to Know Too Much?, supra* note 33.

[40] *Illinois ranks 8th in toxic emission levels*, Chicago Tribune, March 23, 1989.

[41] *Id.*

The public was mostly shocked or surprised at the results as they discovered that large amounts of toxic materials were invisibly being released into their communities. They typically demanded to know how these facilities could be allowed to release toxic emissions of this magnitude and what danger these emissions posed to their health. The chemical industry initially downplayed the significance of the data contained in the inventory, claiming these emission levels did not represent significant exposure or human health risk, and that the information was exaggerated and was causing hysteria and needless concern in communities surrounding many facilities listed.[42] However, many industry executives, faced with data on cumulative toxic releases for the first time, were generally surprised at the size of their emissions. To their credit, upon discovering the size of their emissions, several large chemical manufacturers, including multinational corporation such as Monsanto and 3M, pledged to reduce their toxic emissions by significant amounts.[43]

Did the Legal Mechanism Work?

TRI has proven to be a tremendous empowerment tool for citizens of many communities. The dynamic between the public and industry changed dramatically almost overnight. Citizens, who had previously relied on assurances of businesses and government officials that these facilities were not harming the environment, suddenly discovered that large amounts of toxins were being released in their communities by these facilities. For the first time the public, armed with this new information, was in a position to take part in the decision-making process regarding the release of toxic chemicals, where previously it had been left to the exclusive purview of the various industrial facilities and government regulators. By placing the information in the hands of the public, TRI gave citizens the power to independently review and analyze the emissions of facilities in their communities.

Why Did the Legal Mechanism Work?

The TRI has been successful because TRI data fills a wide variety of need across the public, government and business sectors. This information has raised public awareness and been used by the public in both litigation and negotiation with industry. TRI data has also provided the government with valuable information for identifying problem areas, improving pollution regulation and enforcing existing laws and regulations. Finally, industry has found TRI data a useful tool in improving the efficiency of its processes and in assessing potential liability.

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[42] *Is it Possible to Know Too Much?, supra,* note 33.

[43] *Toxic Chemicals, the Right Response*, The New York Times, November 13, 1988, Sec. 3, p. 3, col. 1.

Public Uses

The TRI data has greatly helped to raise public awareness of toxic emissions and to improve our understanding of the effects these emissions have upon our environment. Citizens and non-governmental organizations have utilized TRI data to protect their communities and bring about pollution reduction using several different strategies:[44]

Citizen Empowerment. The Right-to-Know-Computer Network (RTKNET) was established by two public interest non-profit groups to provide an on-line source of TRI and other databases. Citizens may access RTKNET's internet site to download and obtain TRI information based on geographic area, facility, chemical, or parent company. Citizens who wanted to determine the amount of toxic chemicals being released in their community could do so by accessing RTKNET and entering their zipcode.[45]

Litigation and Enforcement. Citizens have used TRI data in a number of enforcement actions by bringing suit against facilities under the citizen suit provisions of many federal environmental statutes for failure to comply with existing regulations. The TRI data is used both to identify those facilities which have violated the law and again to substantiate the violation in their citizen suit.[46]

Pollution Prevention & Negotiation. TRI has also proven useful to citizens and NGOs in identifying different areas of industry where there is potential for significant pollution reductions. Using the TRI data in negotiations with industry, citizens and NGOs have been successful in bringing about changes in production processes, eliminating or reducing the use of toxic substances in the process. The addition of source reduction information to TRI reporting data has made TRI even more useful in this regard.[47]

Education. TRI data has also been used by citizens, journalists, and NGOs to educate members of the community on the effects of toxic emissions on the local environment. These efforts have played an important role in developing support on the community level for stronger pollution prevention efforts.[48]

Government Uses

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[44] OMB Watch/Unison Institute, *The Right Stuff: Using the Toxic Release Inventor* 3 (July 1995).

[45] The RTKNET internet site can be found at http://rtk.net/E12019T728. For toxic emissions in the UK, Friends of the Earth provides similar information using the **Chemical Release Inventory** of the UK. Visitors to the FoE web site simply enter their zipcode and are presented with a detailed map of the area showing facilities reporting toxic emissions. The FoE site can be found at http://www.foe.co.uk:80/cri/.

[46] *The Right Stuff*, *supra* note 44, at 11.

[47] *Id.* at 12.

[48] *Id.* at 3.

The TRI data has been extremely useful to governmental officials at the federal, state and local level in identifying pollution trouble spots, developing pollution prevention regulations, and in the enforcement of existing laws and regulations. The TRI data has allowed environmental protection officials at each level to view the cumulative toxic releases from all media, providing them with the tools necessary to develop a coordinated program to assure these emission do not pose a threat to the surrounding community or wildlife. Examples of other governmental uses of the TRI data include:

EPA 33/50 Program. The 33/50 program is a voluntary pollution reduction initiative started by EPA in 1991 that promotes the reduction of releases and transfers of 17 high-priority TRI chemicals.[49] Using the 1988 TRI emissions data as a baseline, the program calls for a 33% reduction in releases and transfers by 1993, with a ultimate goal to reduce emissions by 50% in 1995. Nearly 1,300 companies signed up for the program, resulting in emission reduction pledges of these 17 chemicals totaling 380 million pounds by 1995. The program has been a tremendous success, with participating companies exceeding both the interim and final goals. By 1993, releases and transfers of these chemicals had been reduced by 46%, with the ultimate goal of 50% reduction achieved a full year early in 1994.[50]

Emergency Planning. One of the principle motivations behind the TRI disclosure program was to provide local community officials sufficient information to prepare for accidents involving toxic materials, such as the accident that occurred in Bhopal. In the event of an accident involving toxic materials, governmental officials and citizens would be able to use the TRI data to determine the nature of the danger. Since the TRI program began, several different software programs have been developed to make use of the TRI data to assist in measuring dangers caused by fire, accidental mixing of chemicals, and evacuation areas.[51]

Business Applications

Although many business sectors, particularly the chemical industry, were opposed to TRI when enacted, many business have since found TRI data as a very valuable tool in terms of identifying inefficient processes, instituting pollution prevention strategies, guarding against liability, and assessing the competition. Examples of business applications of TRI are:

Real Estate/Investment. TRI data has frequently been used to assess real estate and investment opportunities and transactions. Corporations often use TRI data to assess

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[49] Target chemicals under the 33/50 program are: Benzene, Cadmium & Compounds, Carbon Tetrachloride, Chloroform, Chromium & Compounds, Cyanides, Dichloromethane, Lead & compounds, Mercury & Compounds, Methyl Isobutyl Ketone, Nickel & Compounds, Tetrachloroethylene, Toluene, 1,1,1-Trichloroethane, Xylenes.

[50] EPA 33/50 Program, *Company Profiles: Monsanto Company*, at i.

[51] *The Right Stuff, supra* note 44, at 5.

potential liabilities associated with site contamination before purchasing land or facilities. Similarly, some investment firms use TRI data to measure whether a company can be considered socially responsible.[52]

Assessing Competitors. Many companies have used TRI data as a basis of comparison to judge competitors within their industry. Based on an analysis of the TRI data, businesses may find incentives to improve their environmental behavior.[53]

Marketing of Pollution Control Equipment. Manufacturers of pollution control equipment have been successful in developing new markets by analyzing TRI data to identify potential customers who could benefit from utilizing their equipment.[54]

Pollution Prevention. By far, the most important application of TRI data by business has been in identifying pollution prevention opportunities, both on a company and industry level. The efforts of the chemical industry best illustrate the benefits of utilizing the TRI data both to identify areas where toxic emissions could be reduced and to measure their subsequent progress.

In 1988, in direct response to the data generated by the TRI program, members of the Chemical Manufacturers Association (CMA) adopted the "Responsible Care" program, which required member companies to establish priorities and plans for achieving reductions in toxic waste and releases. The program requires that in accomplishing these reductions, members give first preference to source reduction, second to recycling, and third to treatment. This program has been hailed as a great success by CMA, pointing to a 35% reduction in releases and 39% reduction in waste produced in the period from 1988-1992.[55]

Monsanto. Monsanto, based in St. Louis, Missouri, is the fourth largest chemical company in the United States. In compiling total emissions for its 1987 TRI report, Monsanto discovered it had released over 374 million pounds of toxic substances in the US, 20 million of which was released into the air. In June of 1988, Monsanto's chairman, Richard J, Mahoney, pledged to cut Monsanto's worldwide toxic air emissions by ninety percent by 1992, with an ultimate goal of zero air emissions. In 1987, worldwide toxic air emissions were estimated to be 61 million pounds annually. By 1992, annual toxic air emissions were estimated at 5 million pounds worldwide. Although it should be noted that over half of this reduction came from shutdown of inefficient plants, Monsanto should be credited for making significant investment in

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[52] *Id.* at 6.

[53] *Id.*

[54] *Id.*

[55] Chemical Manufacturers Association, *Pollution Prevention: A Chemical Industry Progress Report (1988-1992).*

pollution prevention as well as utilization of new process technologies to fully achieve this goal. [56]

Monsanto has also been an active participant in EPA's 33/50 program. Using Monsanto's 1988 baseline of 2,567,783 pounds for 33/50 chemical releases, Monsanto met its 50% reduction goal two years early, achieving a 66% reduction in 1993. In 1990, Monsanto made an additional commitment to reduce worldwide toxic emission by 70% by 1995, using 1990 as a base year. If this goal is met it would represent a reduction from 337.7 million pounds of toxic emissions each year to 100 million pounds.[57]

Dupont. Dupont, as the largest chemical manufacturer in the world, not surprisingly, discovered that its reported TRI releases for 1987 exceeded 238.2 million pounds, with over 60 million pounds of toxics released into the air.[58] In response, Dupont established aggressive pollution prevention goals for toxic air emissions, pledging to reduce total air emissions by 60% by 1993, and reduce carcinogenic air emissions 90% by 2000. In addition, Dupont pledged to reduce toxic releases to land by the year 2000.[59] Through 1994, Dupont appeared to be on track to meet these pledges, having reduced air emissions 66%.

Lessons Learned

The experience of the Toxic Release Inventory (TRI) of the United States clearly illustrates what a powerful tool a well designed PRTR can be in bringing about voluntary emissions reductions. TRI has been hailed as the single most successful piece of environmental legislation in terms of producing emissions reductions. In its first eight years of operation, TRI has been credited for reducing toxic emissions in the US by nearly 43%.[60]

By placing the information on toxic releases in the hands of the public, a PRTR has the potential to generate considerable pressure on industrial facilities to reduce toxic emissions at a very low cost. Industrial officials can utilize the same information to identify inefficient processes and cost effective means for reducing toxic emissions. Similarly, the information generated by the inventory can be a useful tool for policymakers in identifying environmental trouble spots so as to best utilize limited resources to achieve the greatest environmental benefit.

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[56] To achieve this goal, Monsanto implemented over 250 pollution control projects at a cost of $100 million. Monsanto has spent an average of $357 million each year on environmental expenditures from 1989-1994. *Environmental Annual Review 1993, 1994, 1995*, Monsanto Company.

[57] *Id.*

[58] Dupont: Safety, Health and the Environment: Performance Data, http://www.dupont.com/corp/gbl-company/she/perfdata.html.

[59] *Toxic Watch 1995* at 263.

[60] US Environmental Protection Agency, *Expansion of Community Right-to-Know Reporting to Include Chemical Use Data: Phases III of the Toxic Release Inventory* (October, 1995).

Despite the tremendous success of the TRI program in bringing about significant voluntary toxic emission reductions, further information is needed to develop a more complete picture on the flow of these toxic substances as they enter the environment. Under the current TRI reporting system, facilities are required only to disclose information on the release and transfer of toxic substances from the plant site, no information if provided as to the actual *use* of the substance inside the facility. If the public is to be able to contribute to discussions on how facilities can achieve greater pollution prevention through changes in production processes, information on the flow of toxic substances through the facility must be made available.[61]

A recent EPA report sent to President Clinton titled: "Expansion of Community Right-to-Know Reporting to Include Chemical Use Data: Phase III of the Toxic Release Inventory," recommends that TRI be expanded to require collection of information on chemical use as part of a proposed phase III expansion of the TRI reporting system.[62] In this report, the EPA advocates the expansion of TRI to include "materials accounting" data, which would provide the public with a comprehensive overview of the use of toxic substances throughout the industrial process of each facility. EPA noted several significant benefits to requiring the reporting of use information.[63] First, the disclosure of materials accounting data could be used to track the flow of toxic materials passing through the facility and serve as a basis of comparison to ensure that release and transfer amounts reported by the facility are reasonable.[64] In tracing the use of toxic chemicals throughout the production process, material accounting data would also allow the public to trace toxic chemicals as they pass through their community.[65]

Material accounting data would ensure that manufacturing facilities would not be tempted to dump toxic substances into the products they produce in order to avoid reporting them as releases or transfers under existing TRI reporting requirements.[66] Also, although the Pollution Prevention Act expanded TRI reporting to include source reduction activities, the data could be used to measure the effectiveness of source reduction techniques.[67] In addition, the data would also assist in the identification of potential exposure problems for employees of the facility.[68] Finally, the data could be used to measure inefficiencies in plant processes, and identify areas where toxic raw material use could be reduced.

As illustrated by the success of TRI in the United States, PRTR can be a powerful tool for identifying and stimulating cleaner production opportunities. Particularly in

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[61] Benchmark, *supra* note 4, at 6.

[62] *Expansion of Community Right-to-Know*, *supra* note 60.

[63] *Id.* at 2.

[64] *Id.* at 4.

[65] *Id.* at 6.

[66] *Id.*

[67] *Id.* at 5.

[68] *Id.*

developing countries, where the environmental regulatory mechanisms are not fully developed, the information collected through a PRTR could serve as a nexus for addressing environmental threats posed by increased industrial activity. Once in place, the information generated by the PRTR can serve as a baseline for future emission reductions. By placing the information in the hands of citizens, PRTRs can also serve an important political function in fostering democratic participation.

> To assist in the development of PRTR in developing countries, governments, NGOs, and industry representatives should work together to develop standardized chemical and facility specific data reporting elements. This standardized data set could then be used in conjunction with computer software that would facilitate the collection, analysis, and dissemination of this information at minimal cost.[69]

[69] *See generally, The Right to Know, supra* note 28, at 2.

Using Government-Industry Partnerships to Achieve Regulatory Goals: The International Cooperative for Ozone Layer Protection*

Introduction

The Montreal Protocol on Substances that Deplete the Ozone Layer is often hailed as one of the great success stories of international environmental law. Less than a decade after the first 24 countries signed the Protocol, production of chloroflourocarbons (CFCs) in developed countries had virtually halted. Estimated global CFC production has declined from 1.26 million tons in 1988 to approximately 300,000 tons in 1995.[70] This was made possible by the clear and tight deadlines for phase-out established by the Protocol and by the efforts of the International Cooperative for Ozone Layer Protection (ICOLP), a unique organization comprised of government officials and industry representatives, to develop alternatives to CFCs.

In the 1970s, scientists began to suspect that CFCs posed a threat to the earth's ozone layer – a layer in the earth's stratosphere that protects the earth from the sun's harmful ultraviolet radiation. CFCs and other ozone depleting substances (ODS) are a diverse set of chemicals used as refrigerants, solvents, foam-blowing agents and aerosol propellants. They had many applications in the electronics, aerospace and cooling industries. Fears of their ozone-depleting potential were confirmed when, in 1986, the World Meteorological Organization published a study documenting the seriousness of the Antarctic ozone hole. Prompted by this discovery, on September 16, 1987, the Montreal Protocol on Substances that Deplete the Ozone Layer was signed.

One of the primary impediments to meeting the goal of a phase out of ODS, was the need to find alternatives. The clear and certain timetables and tight deadlines established by the Montreal Protocol gave companies confidence to invest in new chemicals or processes and incentives to force rapid technological development. Despite many encouraging breakthroughs, however, the search for alternatives still proved especially costly for small and medium-sized companies that lacked adequate resources to research, develop, test and implement alternate technologies.

Summary of the Legal Mechanism

The Protocol set tight and clear timetables for the phase out of ODS. The Protocol originally called for a 50 percent reduction in the production and consumption of most ozone-depleting substances by the year 2000. Since then the protocol has been strengthened to call for a complete phase-out and to speed up the time table for the phase-out. CFC production was virtually eliminated in developed countries by January 1, 1996.

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* This case study was prepared by Claudia Saladin and is based on a much longer 1994 CIEL case study on ICOLP entitled *The International Cooperative for Ozone Layer Protection: A New Spirit at Work.*

[70] Lester R. Brown et al., *Vital Signs 1996*, 69 (1996).

The search for alternatives was facilitated in the United States by changes in the anti-trust laws in the mid-1980s that protected the exchange of non-proprietary information between competitors. This development allowed companies to invest in long-term, more costly research by pooling their resources without the threat of anti-trust sanctions.

What Happened?

In the fall of 1987, the United States Environmental Protection Agency (USEPA) organized small working groups of industry experts to appraise the technical feasibility of phasing out CFC solvent use and the problems posed by transferring technology and knowledge. Those working groups included representatives from Northern Telecom, AT&T, and other companies. After publication of the conclusions from the working groups, USEPA and industry representatives met to discuss the results. At first, industry representatives were quite skeptical of the stated conclusions from the working groups, but when they sat down with USEPA to edit the text of the technical analysis, industry found that they agreed with USEPA on many important points. USEPA, for its part, conceded that industry experts were better technical advisors for the project than the government contractors.

These meetings signified a turning point that initiated the cooperative efforts between industry and government on ozone layer protection. They eventually led to the formation of the International Cooperative for Ozone Layer Protection (ICOLP) in October 1989. ICOLP, an association of international electronics and aerospace corporations, aimed to find economically viable and effective alternatives to the use of ODS as solvents, to distribute information about these alternatives, and to encourage companies to use them. Membership in ICOLP was open to all corporations that used ODS, related organizations or associations, and governments. Members included representatives from the electronics, computer, aerospace, and automobile industries. ICOLP members committed themselves to eliminate ODS use and develop alternatives both for in-house use and for sharing with other companies.

ICOLP essentially functioned as an international clearinghouse to generate, gather, and transfer relevant information on alternatives. ICOLP's strategies included conducting research and development of alternative technologies; writing and publishing, usually with the USEPA, manuals on alternative technologies; providing a database for open access to all pertinent information; sponsoring and conducting workshops that teach alternative production techniques; and assisting companies in developing countries to change to ozone-safe technologies.

USEPA, for its part, was a full partner in the process. In addition to convening and facilitating many of the organized meetings, USEPA assisted in the publication and distribution of manuals. USEPA also participated and facilitated the international outreach of ICOLP.

To help companies in developing countries reduce their dependence on ozone-depleting technologies, ICOLP pioneered environmental technology cooperation. This is a new approach to transferring environmentally sound technology and knowledge that utilizes long-term business-to-business partnerships to promote innovation and entrepreneurship. Companies in industrialized countries work together with developing country companies to devise environmental strategies tailored to the particular needs of each company and region. Through direct collaboration, conferences and workshops, technical manuals and a computerized database, ICOLP provided companies in developing countries with technical assistance and information to help them make the transition to ozone-safe technologies.

ICOLP first extended its efforts internationally by conducting several projects in Mexico designed to promote information exchange and spread ODS alternative technologies. In many ways Mexico was an ideal location for technology cooperation projects. Spurred by a desire to strengthen its position in the NAFTA negotiations, Mexico had recently embarked on an ambitious program to coordinate economic and environmental policy goals. Mexico was the first country to ratify the Montreal Protocol and had continued to be a leader among developing countries in implementation. However, Mexico's electronics industry, one of the fastest growing sectors of its economy, remained largely dependent on ODS. In fact, a 1987 study predicted that Mexico would be one of 13 developing countries with the highest demand for CFCs by the year 2000.

The Mexico technology cooperation project began in 1991 by a partnership formed between the Mexican environmental agency, USEPA, ICOLP and Northern Telecom. The project started in Tijuana, where over 20 Mexican companies publicly committed to enlist in the program. Technology workshops provided a forum where specialists discussed new alternatives. For example, a 1993 joint ICOLP/World Bank workshop covered such topics as the background of the stratospheric ozone depletion issue, the economics of eliminating ODS, international and domestic legislation, available ODS substitutes and alternative technologies, the program for technology cooperation, and how to receive funding to support ODS phase-out. ICOLP members furnished pro bono experts for the project; alternative technology manuals; and access to the OZONET, a computerized, on-line, international database that provides information on ODS alternative technologies. Northern Telecom, who originally created the database for ICOLP, donated it to the United Nations Environment Programme for incorporation into the more extensive UNEP database, "OzonAction Information Clearinghouse."

Did the Legal Mechanism Work?

Most member companies phased out ODS use well ahead of the impending regulatory requirements. Northern Telecom set the standard by phasing out the use of all CFC solvents from its worldwide operations in 1992 and eliminating the use of methyl chloroform in 1993. Although Northern Telecom incurred significant costs in changing

over to ODS alternatives, these were more than offset by significant savings through the reduction of solvent costs, lower CFC taxes, and reductions in waste disposal costs. IBM phased out its use of CFCs in 1993; AT&T completed its phase-out in 1994; and Matsushita and Toshiba by 1995. Digital Equipment Corporation went further, providing ICOLP with free and unrestricted access to new water-based cleaning technology it developed to replace ODS.

Why Did the Legal Mechanism Work?

A combination of factors made ICOLP a success in meeting the goal of phasing out ODS. These factors included clear and tight deadlines for phase out that put pressure on industry to develop alternatives. By promoting cooperation among industries, USEPA could facilitate the cooperation necessary to develop cost-effective alternatives and make them available to all industries, including small and medium-sized businesses and businesses in developing countries. The development of effective and cost-efficient alternatives, in turn, helped build the political will to ratchet up the regulatory requirements and speed up the phase-out. The fact that a clear regulatory framework existed gave industry the confidence they needed to invest in research and development of ODS alternative technologies and processes.

Lessons Learned

The ICOLP example demonstrates the power of private-public partnerships in meeting an environmental regulatory agenda. Within the context of an internationally established framework, a regulatory agency (USEPA) was able to facilitate a multi-stockholder process that brought the regulated community into the process of developing the technological solution to the problem of ozone depletion and to transfer those technologies to developing countries. The primary lesson to be drawn from this is the importance of both elements: a clear regulatory agenda and government-industry partnership.