

The relative advantages of criminal *versus* administrative environmental enforcement actions in Israel

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Most environmental enforcement programs have separate criminal and administrative procedures for addressing violations. Pitting “criminal” *versus* “administrative” enforcement as mutually exclusive alternatives constitutes a “false dilemma”. Clearly, the government response should be influenced by the severity of pollution and the specific circumstances of the polluter. Yet, policy makers seeking to improve environmental compliance need to have a clearer picture about the merits of each approach and their relative effectiveness. This research empirically assesses the effectiveness of criminal *versus* administrative enforcement activities in Israel. After considering the philosophical implications associated with each regulatory approach, the results of a year-long study are presented. A series of performance indicators are utilized, with particular weight on compliance status in the field, to assess the condition of environmental violations several years subsequent to completion of enforcement activities. The state of 100 violations of air, water and hazardous materials laws that had been addressed through the criminal process were matched with results of comparable violations, against which administrative actions were taken. Results suggest that while criminal enforcement is a longer process, compliance following these actions was significantly greater than in administrative enforcement cases. The findings also underline the significance of a systematic follow-up system for tracking violations *after* enforcement actions are complete. Finally, the study confirms the benefits of targeted assistance to improve compliance among violators of environmental standards.

Introduction

Selecting the correct procedure for taking action against polluters raises philosophical questions about societal values and the appropriate relationship between humans and the planet. Selecting a criminal or an administrative response to environmental violations, however, should not be resolved only on a theoretical basis, but also should be based on empirical experience. Even if the ideological virtues of a given enforcement system are compelling, its merits must also be determined by its ability to effectively prevent pollution.

Since the earliest days of environmental regulation it has been argued that the decision to comply with environmental standards is essentially a rational, economic one. Potential violators consciously or unconsciously calculate the likelihood of getting caught against the expected cost of associated penalties. This price is compared with the anticipated expenses associated with compliance costs, and the less expensive route selected.¹ If establishing deterrence among potential environmental violators is a paramount objective of a government monitoring and enforcement system, then it is important to closely assess the outcomes of different enforcement activities and strategies. Yet, objective, comprehensive and external evaluations that contrast the results of different environmental enforcement programs are rare.

There are two reasons why Israel constitutes an especially interesting venue for such an assessment. First, because Israel's government allocates a relatively modest budget for

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Environmental impact

While ongoing research has led to considerable technological advances in the monitoring of environmental compliance, empirical assessment of institutional monitoring and enforcement efforts is relatively rare. This is particularly true in countries with modest resources for overseeing compliance. Addressing a critical and universal dilemma facing policy-makers, the study identifies the relative benefits of administrative *versus* criminal enforcement activities based on follow-up assessment of environmental performance and conditions after enforcement actions. Criminal environmental actions appear to be more effective for improving long-term environmental conditions. This kind of assessment contributes to designing more effective legislation to promote compliance and for ex-post evaluation of enforcement efforts, without requiring high levels of investment or measurements.

environmental protection activities in general, and for environmental enforcement in particular, its experience may be relevant for jurisdictions that lack societal resources for extensive environmental regulatory presence. Second, it is unique because of its long standing “criminal bias” in environmental enforcement.

In 1961 Israel adopted its first modern environmental statute – The Prevention of Nuisance Law. Like all subsequent environmental legislation, the law is predominantly a criminal statute. Indeed, even citizen suit provisions involve private, criminal Attorney General Actions, with maximum penalties reaching six months incarceration. When Israel’s Ministry of Environment was established in 1988, it immediately established a team of inspectors to collect the evidence necessary to indict polluters and other violators of environmental laws.² In 1994 an environmental citizens suit bill became law that allows for civil actions against polluters.³ Yet, the remedies it offers public litigators remain largely limited to injunctions. There are extremely minimal opportunities for individual citizens or citizens groups to receive damages for public interest legal action, and consequently the statute remains largely unused. Private enforcement actions in Israel typically seek criminal sanctions.⁴ As such, in contrast to many Western countries, Israel continues to base much of its environmental regulation and enforcement around criminal law and procedures.⁵ Twenty years after the establishment of an environmental ministry, the salient question is: “Does it work?”

Environmental conditions would suggest that notwithstanding individual success stories, Israel’s enforcement policies are not working well. Air quality violations are rampant, with Ministry for Environmental Protection spot checks during the past decade identifying upwards of 50% violations of emissions standards. Accordingly, 15% of the time ambient air pollution exceeds the national standards.⁶ Epidemiological studies consistently confirm high mortality attributed to urban ambient pollutant concentrations.⁷ Water contamination has also reached crisis levels. During the past decade, some 282 wells have been closed due to high pollution concentrations in Israel’s coastal aquifer – the single largest source of drinking water. Despite almost two decades of efforts to restore local streams, the combined impact of nonpoint and source discharges has left them devoid of meaningful, aquatic, ecological systems.⁸ Recycling levels remain below 20%, even as national regulations require municipalities to recycle a minimum of 25% of solid waste collected.⁹

While such figures are discouraging, they do not provide clear insights as to how the existing enforcement system is performing. Indeed, it may be that given a very poor historic baseline, and the modest resources available to promote environmental compliance, Israel’s enforcement system is actually efficacious. In other words, the problem may be logistical – lack of sufficient enforcement personnel or monitoring capacity – rather than substantive, due to inherently inappropriate procedures.

In the past, there have been calls in Israel and elsewhere to shift the focus of enforcement efforts from a criminal to an administrative framework. One justification for such a change is pragmatic, based on the notion that a more flexible approach would allow regulators to more effectively attain results. On a philosophical level, it was claimed that environmental violations do not reflect the same level of anti-social behavior that society combats in conventional criminal statutes. Environmental protection, a relatively new societal challenge, is still evolving

and so criminal actions are typically inappropriate and should be reserved for rare and extremely heinous and premeditated pollution cases.¹⁰ In addition, by providing violators with information and assistance, administrative enforcement promised to increase the likelihood of improving compliance among environmental violators.¹¹

Yet, this position never gained a clear consensus, particularly in Israel, and criminal orientation in environmental enforcement actually increased. (Indeed, the anti-criminal camp’s popularity appears to be in retreat as general awareness about the importance of environmental issues and the adverse implications of pollution have become more commonplace). The opposing, principled position favoring criminal enforcement for environmental infractions counters that there are few, if any, practical advantages to administrative enforcement and that ideologically, environmental infractions with their deleterious impact on public health and ecological systems should be perceived and responded to as criminal behavior.¹²

Ultimately, like the UK, Israel’s public policy chose not to see the question as an “either–or” dilemma, but rather attempted to take advantage of the best of both systems.¹³ Over a period of two decades, a bifurcated system of enforcement evolved in Israel’s Ministry of Environmental Protection. The country’s six regional directors oversee an administrative enforcement program which relies primarily on field visits that report violations, warning letters, hearings and licensing authorities to persuade violators to abate polluting activities.¹⁴ At the same time the Ministry of Environmental Protection’s “Green Police” retains responsibility for criminal investigation with indictments based on the evidence it collects that are then filed by attorneys working for the Ministry’s Legal Advisor.¹⁵ Yet, it is unclear which types of cases should be enforced through the ministry’s administrative or criminal program. Additionally, decision makers have little data pointing to a given approach that should be strengthened and what the precise interplay between the two systems should be. While internal procedures have been drafted, clear criteria were never established for precisely determining the optimal route for responding to a given environmental violation.

We conducted an empirical assessment, contrasting the effectiveness of criminal *versus* administrative enforcement systems in addressing air, water and hazardous materials violations in Israel. An equal number of cases involving criminal and administrative enforcement of environmental violations committed between 2000–2005 were compared. There is a long list of performance indicators which can be used to assess the effectiveness of an environmental enforcement system.¹⁶ While these often include “outputs” – such as the number of visits to factories or reports written – the study primarily preferred to rely on actual “outcomes” and the actual results in the field, after completion of enforcement actions.

This article presents the key findings of the study. It begins with a more detailed review of the positions advocated by traditional proponents of criminal or administrative enforcement in the environmental realm. It then offers a brief description of Israel’s environmental enforcement system. After detailing the methodology selected for the study, the results are presented and discussed. Finally, the implications of the study in determining the balance between criminal and administrative enforcement in other jurisdictions are considered.

Environmental enforcement: Criminal versus administrative

Internationally, environmental enforcement systems rarely rely on a single method (criminal, administrative or civil) for enforcement, but rather seek to utilize a range of tools in the regulatory tool box. A hierarchy of enforcement responses, originally proposed by Braithwaite (1987) and presented in Fig. 1, is now commonly accepted.

The process begins with basic administrative steps to inform polluters that a violation that must be removed has been identified. (This is often called a “notice of non-compliance”.) If friendly persuasion is not compelling, more demanding warning letters are issued. These are followed by formal hearings, then civil and ultimately criminal penalties imposed, with increasingly severe economic ramifications involving the closing of the violating firm. Some commentators have argued that imprisonment should constitute the pinnacle of the pyramid since those penalties are reserved for the most egregious and intentional violations of environmental law with license revocation often associated with the administrative measures, located lower in the pyramid.¹⁷ Israel’s enforcement system would seem to reflect the latter position. Most European countries¹⁸ and states in the US have also come to adopt a similar approach¹⁹ in which regulators begin with administrative measures and only bring criminal indictments as a last resort. But in either case, conceptually the approach remains the same: enforcement agencies ostensibly are empowered to steadily escalate the pressure on violators, as depicted in Braithwaite’s pyramid.

Many theoreticians posit that while the distant possibility of criminal penalties provides an important backdrop for establishing an atmosphere of deterrence, first and foremost, regulators should perceive environmental violators as “clients” in need of assistance to reach compliance.²⁰ Calls for “responsive regulation”, in which officials work with the private sector to develop regulations, presumably have the potential to engage the regulated community, minimize adversarial dynamics and lead to higher compliance.²¹ If the true interest of the environment and natural resources is to attain compliance and not to accrue an impressive record of penalties, then criminal actions – it is argued – should ultimately be seen as a sign of failure.²²

Others take an opposing view, arguing that pollution and other environmental hazards violate fundamental human rights and should be addressed with the same degree of severity that society wields against other forms of physical abuse.²³ This holds

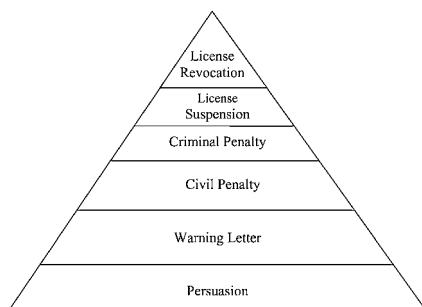


Fig. 1 Escalating regulatory responses to environmental violations (see Ayres and Braithwaite²¹).

implications for an enforcement strategy. A conciliatory approach to environmental violations, with censure or administrative fines the government’s default response, callously accepts grave insults to human health and the environment as just another cost of doing business. Presumably, only punitive measures can send a clear message and transform societal norms.

From a practical standpoint, administrative enforcement surely allows regulators to be more flexible.²⁴ It also avoids the extensive delays and costs typically posed by court adjudication as well as eliminating a non-productive, “confrontation” period during which environmental improvement may be minimal and regulatory influence non-existent. The level of proof required to attain a conviction makes the investigation process and litigation itself much more tedious and driven by the minutiae of evidence law. As such, administrative enforcement is typically perceived as less costly. While this may be the case, the position enjoys little empirical confirmation.²⁵

On the other hand, administrative enforcement may undermine fundamental policy principles. For most corporations, the stigma of criminal conviction and/or incarceration trumps any economic calculation which might lead to anti-environmental conclusions. When this alternative appears unlikely, firms may choose to defer investment in environmental infrastructure, personnel or equipment under the assumption that in the unlikely event that they are caught, the only consequence will be a warning letter or the odd administrative penalty. Rather than creating a “polluter pays” dynamic, the message becomes: “it pays to pollute”.²⁶ Because environmental violations are so widespread, many infractions will not be identified or addressed. Accordingly, an environmental enforcement system must rely on deterrence to motivate potential polluters to seek compliance even when it involves incurring considerable costs. Here, criminal enforcement appears to have clear advantages.²⁷

After the theoretical debate exhausts itself or stalemates, decision makers are faced with the practical question: “What will bring about the best environmental results?” As mentioned, there is a general dearth of empirical research which supports the validity of an “escalating” approach towards environmental enforcement with administrative measures preceding criminal activities. Some studies are sanguine about the power of persuasion. For instance Brown *et al.*, reported that in 76% of the cases, environmental violations were willingly removed simply on the basis of an oral request from a government regulator.²⁸ Yet, regulators in the field often reach other conclusions; over time, direct criminal action against environmental violators has become increasingly popular.²⁹ The trend in Europe appears to be a slow and steady rise in the popularity of criminal enforcement against environmental polluters.³⁰ For instance, the European Parliament recently approved a new Directive (2005/35/EC) that would impose criminal penalties, not only in severe cases of maritime pollution, but also in relatively minor ones.³¹ Similarly, in the US, between 1983 and 2000, there was a ten-fold increase in the number of criminal actions initiated.³²

Israel’s environmental enforcement system

Israel’s Ministry of Environmental Protection is ostensibly responsible for environmental compliance in the country. Other ministries such as Interior, Health and Infrastructure play a role

in environmental management as well, and local municipalities often maintain environmental protection units that are involved in public education, business licensing and responding to local nuisances. The Ministry is a relatively modest regulatory agency, with a basic budget below 50 million dollars and a total staff of a few hundred workers.

Administrative enforcement against environmental violations in Israel is largely delegated to the ministry's six regional offices. The director of each region oversees a professional team which issues permits, monitors, advises and works in public education. When a violation is detected by the regional staff, but is not deemed sufficiently severe to warrant a criminal investigation, an administrative procedure ensues. A letter of warning is issued by the Regional Director. If this is not effective, a hearing is held where the individual responsible for the violation is asked to present a plan of mitigation. If this does not successfully persuade the violator, theoretically, the Regional Director submits the file to the Green Police for the commencement of a criminal investigation. An internal document entitled "The Bible of Enforcement" was prepared for the Ministry. It details timetables according to which these processes are to take place. But it has not been applied in practice.

The criminal enforcement process in Israel is conducted through two different departments at the Ministry of Environmental Protection. Roughly 40 inspectors work in a national unit called the "Green Police", although the unit is not formally associated with Israel's police force. Parallel adjacent teams work independently in the area of enforcing marine pollution, nature protection and animal welfare laws.)³³ The Green Police have only limited authorities to interrogate suspected violators and to issue penalties. Yet, the inspectors are frequently in the field, using their 4 × 4 vehicles to seek out polluters, respond to complaints, provide an enforcement presence, photograph and document violations, and occasionally take samples. If an environmental infraction is deemed to be significant enough to be considered a criminal offense, a formal criminal investigation ensues and witnesses are invited for interrogations.

When sufficient evidence is available for conviction, the materials are sent with a recommendation to the legal department at the Ministry. The legal department oversees a team of private attorneys who are selected *via* a public tender with actual prosecution of cases "out sourced". The private attorneys prepare indictments, file them in Magistrate courts across the country and conduct the trial according to directives provided by the ministry attorneys who make strategic decision in the cases.

Methods

The research design called for evaluation of enforcement effectiveness in a sample of 200 cases: 100 that were addressed as criminal actions and 100 as administrative procedures. Cases were divided into one of three groups based on the substantive environmental violations of air quality, water quality or hazardous materials laws. The rationale for the selection of these media involved the severity of the associated problem at the national level and the existence of a survey of enforcement actions in the area of solid waste that was previously conducted.³⁴ Because there are considerably fewer criminal enforcement actions than administrative ones, initially 100

criminal files were randomly selected from archives housed at the Ministry of Environment headquarters in Jerusalem that contain all final court rulings made in these three areas between the years 2000–2005. The dates were selected in order to evaluate the long-term impact of a sampled enforcement action, but were sufficiently current to reflect recent changes in enforcement practices and policies that did not exist during the 1990s.

The electronic database monitoring criminal enforcement activities used by the Ministry of Environment was found to be too imprecise for research purposes. Therefore, basic data for the study were extracted directly from Ministry files and court decisions. These include the precise location of the violation, the statutory infraction involved, the existence of previous environmental violations, a detailed timetable for the different stages in the enforcement process, penalties issued, whether a "plea bargain" had been offered and other potentially relevant information. When variables were missing, prosecution files prepared by the Green Police were accessed to compile the requisite information. Each file selected was then categorized according to criteria based on the type of violation, type/size of polluter and the magnitude of the violation so that a matching administrative case could be selected for comparison.

The full national database of criminal enforcement actions was then reduced to only include violations committed in four of the country's six regional offices (the Southern, Greater-Haifa, Greater Tel Aviv and Central Regions). This was done to ensure a geographically representative sample and to prevent possible biases associated with *de facto* enforcement policies implemented by the different regional directors and their staff. A random sample of 100 criminal actions was then selected and stratified to include a critical mass of examples of water, air and hazardous materials violations.

Subsequently, an extensive review process of administrative enforcement files took place at each of the Ministry's regional offices in order to identify "matching" administrative cases. (The number of administrative environmental enforcement actions is typically greater than criminal actions by an order of magnitude). Based on the aforementioned criteria, appropriate cases were selected in the regional offices that involved comparable circumstances to the 100 criminal files previously selected. The data fields from the administrative cases were then recorded. The result was an initial database of some 200 cases, stratified as pairs of comparable criminal and administrative cases that were then analyzed.

Ultimately, twenty of these cases were disqualified from the assessment because of specific circumstances which made them anomalous or inappropriate for comparison or absence of critical data (*e.g.*, unreliable air emissions testing). In a few instances, no meaningful, parallel administrative examples were found. For instance, there was no administrative enforcement case to match the criminal indictment of hazardous materials dumping in Jordan. The final sample for the study consisted of 80 criminal and 80 administrative cases.

From February through November 2008, site visits were conducted in order to characterize present conditions on-site where violations had taken place. Each violation site was visited by the three members of the research team who were accompanied by a member of the Ministry's "Green Police" force and a 4 × 4 field vehicle to ensure access to all locations and polluting

facilities. The team photographed the site and listed the key independent and dependent variables required by the study.

Performance measures of environmental enforcement effectiveness are frequently divided into two general categories: actual pollution levels and compliance status.³⁵ Given the variety of the violations, some of which do not produce direct, measurable emissions or environmental damage, the former type was deemed a more appropriate basis for assessing enforcement effectiveness.

In a pilot run, a simple 3-tiered scale was tested for quantifying the effectiveness of an enforcement scale and the level of compliance. The scale was calibrated in pilot site visits with team members and with Ministry enforcement staff to ensure the replicability of grading and proved to be extremely reliable. Accordingly, each violation in the database was given a rank of 1–3. The following is a description of the ranking system used as a dependent variable for level of compliance:

1 – A case in which the environmental violation had been totally removed;

2 – A case in which an environmental violation had been partially removed. (For example, there was a case where pirate garbage site had been the site of repeated, illegal burning. The fires had ceased, but the violator continued to dump trash in the illegal dump.)

3 – A case where the environmental violation remained largely unchanged. (For example, in an adjacent site, signs of a recent fire of garbage by a farm operation were clearly identified.)

In many instances, in order to ascertain the level of compliance field visits had to be supplemented with clarification in the regional offices of the ministry to check the validity of licenses or permit stipulations (e.g., for handling hazardous materials or emission standards, etc.) In the case of air pollution violations, after visual checks in the fields, results largely relied on the findings of the Ministry's ongoing spot check program and regular effluent discharge or monitoring results. In several cases, a violating factory or facility that had gone out of business were given a grade of "1" – violation fully removed, even though it was not always possible to fully ascertain whether the closure was a direct result of environmental enforcement activities or other causes.

Data analysis was conducted using the "statistical" statistical package. Two dependent variables were selected as the leading indicators for "successful" enforcement:

- The conditions identified on site; and
- The duration of the enforcement process.

Independent variables included geographical region, type of environmental violation, type of violator, etc. Assessments of association between variables were made using basic T-testing, which is appropriate for two ordinal or nominal variables. While the sample size is small, it contains the majority of the criminal actions filed against water pollution, air pollution and hazardous material violators in Israel during the study period. Given the strong trends that emerged from the analysis, we can offer several conclusions.

Results and discussion

General

A threshold question of course is: "what percentage of criminal environmental enforcement actions ended in conviction"? If

conviction levels are low, then clearly, administrative persuasive activities offer a more promising strategy. Here, the numbers are impressive indeed. Of the enforcement cases randomly selected for the survey, only 5% resulted in acquittals. This is an extraordinary record, albeit the high conviction rate can also be explained by the many cases in which plea bargains were reached resulting in partial acquittals or moderate penalties. The next question, however, is more complicated – "what were the environmental results of the criminal convictions"?

Although environmental laws in Israel all include periods of imprisonment among possible penalties, in practice Israeli courts do not issue sentences of jail-time for environmental violations. In rare cases, community service is required of convicted violators of environmental laws. Fines, while common, typically are not high. And like many other jurisdictions³⁶ collection in Israel is often unsuccessful.³⁷ Indeed, Israel's State Comptroller recently called the Ministry of Environmental Protection to task for collecting only about half of the fines issued against environmental criminals.³⁸

The most fundamental indicator of enforcement effectiveness, the actual conditions on the ground subsequent to enforcement action, showed criminal enforcement to be clearly advantageous. For example, at 76% of the sites where criminal environmental infractions had taken place, no signs of the hazards and violations targeted could be found (two years or more subsequent to the completion of criminal enforcement activities). By way of contrast, site visits to areas which had been the subject of administrative enforcement activities revealed that only 51% of the environmental violations had been successfully removed.

The effectiveness of criminal action was not uniform across all environmental media. Remediation of water pollution violations after criminal enforcement was particularly high, with 82% of hazards removed, as opposed to 60% of air violations and 72% of violations involving hazardous materials. By comparison, in cases involving administrative enforcement actions against water quality violations, 59% were removed, 55% successful removal of violations of hazardous materials was recorded and only 24% successful administrative intervention against air pollution violations. Fig. 2 and Fig. 3 show the breakdown of criminal and administrative violations studied according to media and their relative success rates in removing them.

Air quality

While clearly there is room for improvement in all areas, the findings reflect a particularly significant systemic flaw in enforcement against air quality violations. These problems have

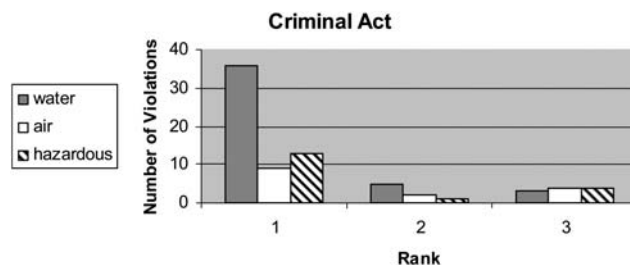


Fig. 2 Ranking of criminal procedure outcomes in water, air and hazardous materials violations.

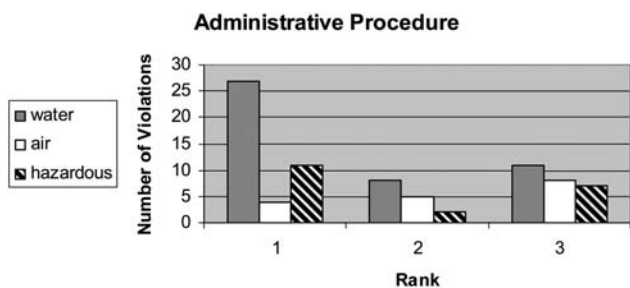


Fig. 3 Ranking of administrative procedure outcomes in water, air and hazardous materials violations.

been recognized for some time and are often attributed to insufficient monitoring capabilities of air emissions, the high cost of chemical analysis for regulators and poor follow-up after spot checks reveal violations of air emission standards. Dozens of factories were identified in spot checks with stack emissions substantially higher than allowed levels, with exceedances often reaching 1000 percent higher than allowable levels. Yet, criminal indictments were rarely forthcoming.

Accordingly, Israel's experience suggests that some forms of pollution are easier to identify and address than others. Finding discharges of unpermitted effluents into surface waters or inappropriate storage of hazardous chemicals and preparing legal actions constitutes a far easier and less costly task than taking samples from smoke stacks, having them analyzed, ensuring quality control, *etc.* As a result, the actual number of legal actions against air pollution violations is low. Table 1, taken from the Ministry of Environmental Protection's web-site shows the rate of administrative actions taken against air quality violations. Yet, even these limited legal actions have not proven to be effective in removing hazards. Administrative enforcement actions against air polluters was the only category studied where less than half of the environmental problems targeted were removed.

It is also worth noting that the modest air pollution enforcement that does take place does not focus on the most problematic sources. For instance, the vast majority of criminal actions taken against air pollution infractions involved the open burning of garbage which is absolutely prohibited with a tough *mens rea* standard of strict liability. Fig. 4 shows both the relatively modest number of violations that could be assessed and the substantive breakdown accordingly.

Table 1 Administrative enforcement actions – air quality: 2008^a

Ministry district	Criminal indictments	Remedial actions required	Warning letters or admin. hearings	No. of follow up checks	Number of violating factories
North	0	4	2	0	6
Haifa	0	3	3	3	9
Center	0	1	1	0	2
Tel-Aviv	0	1	1	0	2
South	1	2	4	0	7
Jerusalem	0	1	2	1	4
Total	1	12	13	4	30

^a Source: Israel Ministry of Environment Web Site, www.sviva.org.il, January 11, 2009.

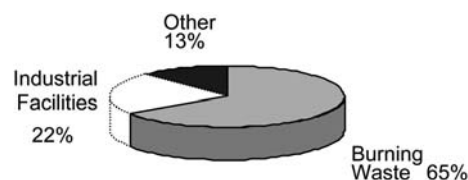


Fig. 4 Violations of air quality according to issue.

As most indictments involving illegal burning of garbage are associated with agricultural activity, ascertaining the responsible party is relatively easy and evidence is relatively trivial, requiring no more than a photograph of the burning trash. While burning solid wastes can produce dioxins and is clearly an environmental hazard, it is hardly the cause of Israel's chronic and acute urban air pollution problem and the high associated morbidity. In short, violations by old bus fleets, chemical industries and other major sources that make air pollution Israel's greatest public health problem constitute a far greater challenge to enforcement agents but appear to be almost systematically avoided.

Water quality

Some 57% of the cases reviewed involved water quality violations. The range of violations was broad, from illegal discharge of industrial and municipal sanitary effluents to discharge of pollutants from garages, restaurants and slaughter houses. Here the gap between administrative and criminal enforcement activities was particularly dramatic: Criminal actions led to complete removal of the problem in 82% of the cases, where parallel administrative enforcement efforts only led to 59% abatement.

Water quality violations proved relatively easy to identify. Yet, the solution to the problem frequently requires infrastructure investment which is both costly and time consuming. Often this means that the environmental damage will continue for some time. This phenomenon was very conspicuous among enforcement actions against gas stations which, in some cases, took regulators a full seven years to reach a comprehensive solution to leaking underground storage facilities, leaky piping *etc.* The case of dairies, described below, involves similar dynamics. But because of a unique regulatory program, the results were far more expeditious and impressive, making them worthy of elaboration.

The case of Israeli dairies

During the 1990s, dairies and feedlots were identified as the most polluting source of agricultural pollution in Israel.³⁹ During the fall and winter seasons, heavy rains would carry away copious quantities of manure into waterways and the nutrients and bacteria would percolate into groundwater and other reservoirs. In addition, dairies were a major source for flies, unpleasant odors and aesthetic nuisances.

The "Milk Industry Reform" was launched in 1999 and continued through 2007. Most Israeli facilities for milking cows were established during the 1950s and 1960s when environmental awareness was low and when there was relatively little emphasis placed on economies of scale. The objectives of the program were two-fold: The first involved increasing the efficiency of Israel's

dairy industry and expanding production by reducing the associated costs through the merging of small neighboring dairies into larger regional facilities. The second objective was environmental, by establishing drainage infrastructure that would reduce the off-site flow of water during rainfall events and capture runoff, treating the associated effluents and recycling the water.⁴⁰

An agreement between the Ministry of Finance, the Agricultural Ministry and Israel's Dairy Trade Association laid out each party's responsibilities: The Ministry of Environmental Protection provided the professional directives and standards for water pollution prevention measures; the Ministry of Finance set conditions for financial assistance to facilitate the mergers and infrastructure investment. The trade association was active in facilitating mergers between smaller dairies and engaging them in the program. Government cost-sharing covered 30% of the "efficiency" investment and 50% of the environmental infrastructure.

The results were dramatic indeed. By 2005, after an investment of over 250 million dollars in environmental infrastructure and 200 million dollars in efficiency mergers, 97% of dairies in Israel had implemented their environmental and efficiency plans. The program led to a net reduction of 30% in the number of individual dairies (leaving 1025 units). At the same time, actual milk production increased through the emergence of larger, more efficient cooperative units.⁴¹

Although field visits revealed tremendous progress in the area, a small number of facilities still exhibited defects in physical structures making them likely contributors to water pollution. Indeed, only 58% of the dairies whose discharges had been addressed *via* administrative enforcement action were classified as pollution free. This was in stark contrast to the dairies which had been faced with criminal indictments. These were found to be 100% upgraded and pollution free. The superior performance supports the contention that the cost-sharing "carrot" and cooperation aspects, so frequently highlighted with regards to the initiative's success, were important. At the same time, they were bolstered by the regulatory "stick" and uncompromising criminal actions when pollution abatement was not fully pursued by the dairies.

Hazardous materials

As many of Israel's industrial facilities and warehouses with significant quantities of hazardous materials are located contiguous to crowded residential areas, the public health significance of safe handling of these materials cannot be overstated. In addition to human error, there are important additional factors that raise the associated risks in Israel. These include high seismic instability across the country and elevated earthquake rates as well as ongoing vulnerability to terrorist attack.⁴² Indeed, the absence of stringent handling procedures is reflected in Israeli news reports which periodically describe explosions in factories or warehouses due to inappropriate handling.

Most infractions identified in the area of hazardous materials do not involve discharges but rather violations of storage regulations. Many visits to the sites of past violations of hazardous materials laws required supplementary clarifications from the Ministry's regional offices. Bureaucratic records and permits

were examined to see whether industries had the required permits to handle hazardous materials, and whether the conditions stipulated were met. The gap between criminal and administrative enforcement actions was also apparent in this realm, with 72% of criminal enforcement activities enjoined with only a 55% success for administrative actions.

Engaging local authorities

In Israel, municipalities are responsible for solid waste collection and disposal as well as sewage treatment. Frequently the primary culprit for a pollution problem is local government itself. Israel's experience is unique in that it has established an impressive record of criminal enforcement actions against municipalities as well as personal indictments against mayors.

Some twelve municipalities were included among the polluters in the study sample – six of which faced criminal charges and six of which involved administrative enforcement actions. Half of the municipalities ($n = 3$) that faced criminal charges responded by removing the violation; only one appeared to take no action whatsoever. The efficacy of administrative action was far lower. Four of the cities did not appear to respond at all to administrative calls for improved environmental performance. Because of the small sample size it is unwise to make a sweeping conclusion. But the relatively strong performance of criminal enforcement proceedings against municipalities is worthy of note.

Duration of enforcement process

One of the parameters of an effective enforcement system is the swiftness with which a regulatory body can respond to a violation and facilitate procedures against violators. Not only is nineteenth century jurist William Gladstone's old legal adage: "*Justice delayed is justice denied*" applicable. The ecological parallel: "*There is such a thing as being too late*" is also relevant. Accordingly, among the variables measured in the comparison was the length of time that each respective enforcement process took to bring about the desired outcomes. The duration of an enforcement action was defined in the administrative process as beginning with the first warning issued to a violator until the date when the Ministry of Environmental Protection *regional office* reported the end of its engagement in enforcement activities. Criminal enforcement was defined as beginning with the opening of a criminal investigation until the issuing of a court order on the subject.

Criminal procedures were anticipated to be longer than administrative enforcement efforts, primarily due to the large backlog of cases in Israel's court system. This was confirmed by the study's findings. Some 46% of administrative cases were successfully concluded within two years as opposed to 27% of criminal cases. Fig. 5 contrasts the average time taken in each type of enforcement action.

The criminal enforcement process is typically divided into three stages:

(1) the initial investigation and collection of evidence conducted by the Ministry's "Green Police";

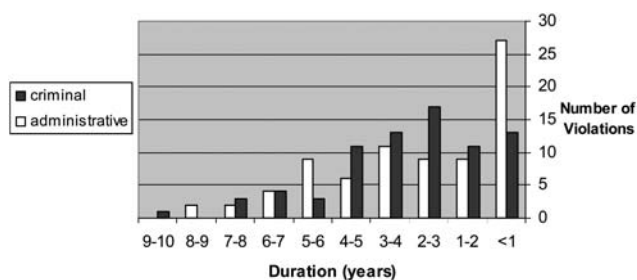


Fig. 5 Duration of criminal and administrative procedures (years).

(2) the amount of time taken by the private attorneys to prepare the indictment and its approval by the overseeing attorneys in Ministry headquarters; and

(3) the duration of the court hearings and appeals.

From the perspective of the Ministry of Environmental Protection, the protracted court time remains highly problematic, but is largely beyond its jurisdiction to change. At the same time, much can be done to speed up the first two stages of the enforcement process

The average time for each of the three stages was calculated. The average duration of the initial criminal investigation was 0.3 years (4 months) per case. In stark contrast, the actual writing of the criminal indictment – a relatively succinct document under Israeli standards (typically less than 3 pages) – took an average of an entire year. (It is worth noting that the Ministry of Environment’s draft internal directives contain timetables for enforcement work that set the maximum time for preparation of an indictment at 3 months.) As expected, from the moment that the court indictment was filed, an additional 2.1 years on average transpired before a final ruling was made. Fig. 6 indicates the time that each stage takes in this process.

As mentioned, administrative enforcement procedures include informal clarifications, a formal warning letter with a request for remediation and in the event of inaction, an administrative hearing with a ministry regional director. No clear timetable has been formally adopted for progressively moving through these stages, although recommendations for setting limits for each one have been made in the past. In theory, should administrative enforcement efforts not produce the desired outcome, the regional directors are to refer the matter to the Green Police who initiate a criminal investigation. In practice, there are many cases where administrative responses dragged on and there appeared to be a reluctance among regional directors to concede their influence on the matter by transferring it to an independent criminal investigation team. As Fig. 5 shows, while a greater number of administrative enforcement procedures appear to be

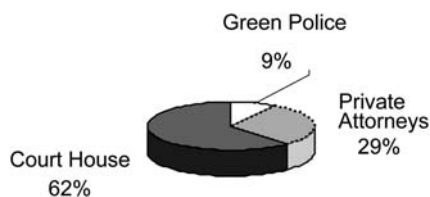


Fig. 6 Breakdown of duration of criminal proceedings according to stage/institution.

resolved within one to two years, there are also more administrative than criminal cases that suffer from extreme delays of five years or more.

While criminal enforcement is advantageous in terms of the ultimate outcome, there is a price to be paid in terms of delays. During the court proceedings, polluting activities often continue, causing ecological impacts or deleterious effects on human health. The Ministry’s ability to affect conditions during this period may be minimal as it has already “fired” its heaviest ammunition. Clearly, there is room for increasing internal efficiency and reducing the present delays associated with criminal environmental actions. But paradoxically, as Ministry efficacy improves, the percentage delays due to court backlog (currently absorbing 61% of the delay in the enforcement process) will only increase.

Conclusions

There are three major findings to emerge from the present study that are relevant for environmental regulators, especially in states without considerable resources for environmental management and regulation. They all suggest that jurisdictions considering a greater emphasis on criminal environmental enforcement should be encouraged by Israel’s experience.

First, although it is somewhat more protracted, the criminal enforcement process against environmental violations in Israel appears to be more effective than the alternative administrative actions. This is reflected in both the results in the field and subsequent compliance levels. The success relative to administrative actions can be attributed to deterrence: a fear of anticipated sanctions and the stigma associated with convictions. This contrasts starkly with the lack of clear consequences for ignoring administrative enforcement activities. Administrative enforcement suffers from the lack of a clear framework and timetable which strongly weakens deterrence.

There are increasing calls for the creation of meaningful penalties that could be issued administratively without the need to resort to the court system. In fact, a recently enacted new Clean Air Act grants such authorities to the Ministry of Environmental Protection, beginning in 2011.⁴³ (Violators who would not want to pay these fines will be able to appeal them in court.) Offering such powers to government enforcement teams should upgrade their effectiveness dramatically.

Second, at present there is a distinct lack of a systematic and operational protocol for the monitoring of violations and the conducting of formal follow-up visits after enforcement actions. For example, once a major exceedance of an emissions standard in a spot-check is identified, there is no procedure that ensures that another inspection will be scheduled in a timely matter to determine whether the violation continues. In general, it takes far too long to decide that administrative persuasive measures have run their course and that criminal action is required. Similarly, following a successful administrative enforcement procedure or a court decision, no formal process exists for site-visits to ensure that compliance is maintained.

Third, while the importance of mixing “carrots” and “sticks” is among the more hackneyed axioms in environmental regulation, it does not make the effectiveness of these combinations less potent. The case of Israel’s intervention to upgrade the

environmental infrastructure in its dairies suggests that when funds are available for assistance, there is a far greater likelihood that compliance will be forthcoming. Enforcement personnel have an easier time presenting a tough position when they have something to offer the regulated community in solving an environmental problem.

It would seem that in the Israeli environmental context, criminal enforcement, when it is undertaken is working. The high level of convictions coupled with the relatively impressive long-term impact of court decisions suggests that deterrence is better achieved through this system, even as the long time of adjudication constitutes a substantial drawback. Rather than any inherent flaws in criminal environmental enforcement per se, Israel's poor environmental conditions may largely be a function of the limited amount of resources dedicated to environmental protection in general and the inadequate number of enforcement actions initiated in particular. Modern environmental regulation is no longer new. It is likely that in numerous cases, continuing violations and exceedances involve "hard cases" where administrative/persuasive activities will not change behavior and polluting activities. An adequately funded, effective criminal enforcement system can solve many of these problems.

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