מכון ירושלים לחקר ישראל
המרכז למדיניות סביבתית
מיסודה של קרן צ'רלס ה' רבסון

יישום אפקטיבי של מדיניות סביבתית

עידוד הציות וייעול האכיפה

אור קרסין

The Jerusalem Institute for Israel Studies
The Center for Environmental Policy
Established by the Charles H. Revson Foundation

Enforcement of Environmental Regulations:

Increasing the Effectiveness of Environmental Protection Policies

Orr Karassin

2009

The Center for Environmental Policy Studies Series no. 32

Enforcement of Environmental Regulations:
Increasing the Effectiveness of Environmental Protection Policies

Researcher: Dr. Orr Karassin

This publication was made possible through funding by
the Jewish National Fund (JNF) and the Charles H. Revson Foundation.

The Hay Elyachar House
20 Radak St. 92186 Jerusalem

http://www.jiis.org.il
E-mail: machon@jiis.org.il

Executive Summary

I. Introduction

This study proposes a method of judging the effectiveness environmental compliance and enforcement (ECE) efforts. It works through the goals and objectives of environmental enforcement and compliance regimes, as well as the exercise of enforcement tools, to architect a framework of indicators and an index that provides the data required to assess the performance of ECE programs. The study suggests enforcement agencies use indicators to continuously and reflexively evaluate the effectiveness of their enforcement regimes. The analysis and evaluation of properly defined and constructed data is a prerequisite to logical decision making in revising existing laws, modifying enforcement jurisdiction and reforming implementation tools. Indicator implementation and analysis has the capacity to promote reflexive reassessment of goals and encourage steady improvement in the integrity and efficacy of environmental enforcement schemes. It supports efforts to ensure good governance and accountability.

The study has both generic and widely applicable components as well as components specific to the Israeli enforcement context. Enforcement efforts taken by Israel's Ministry of Environmental Protection serve as the backdrop for analysis and are used to demonstrate the application and benefits of the suggested Goal Oriented Model (GO Model) Index. The application is made in the field of building and construction waste regulation enforcement in Israel. However, some of the conclusion from the application may have wider relevance, both in Israel and elsewhere.

II. The Goals of Environmental Enforcement

Setting goals is a primary and principal step in the planning of any enforcement program. It is also a prerequisite in evaluating the effectiveness of environmental enforcement and compliance programs. Enforcement activities should be evaluated according to their demonstrated ability to achieve the goals set for them.

The process of setting goals for enforcement measures must be structured and participatory. If goals are to be acceptable and widely acknowledged agencies must engage stakeholders both from within and from outside the regulatory agency. The resulting goal definition must be clear and concise enough to translate into metrics for indicator identification and weighing. This can be achieved by using multicriteria decision analysis methods (MCDA) to define and weigh goals.

Three seemingly non-congruent, overarching goals are identified for ECE:

- **Maximizing Environmental Benefit** – directing enforcement measures to sectors and areas that promise the greatest environmental benefits, without regard to the social costs that may accompany this (such as a decline in the GDP, harming an industry's competitiveness, causing layoffs or shutting down factories).
- **Maximizing Social Benefit** – directing enforcement measures according to economic optimization considerations. According to this approach, enforcement measures should be exercised whenever the environmental benefits outweigh the social costs. This goal is content with achieving a socially optimal level of pollution, and does not aim to reduce pollution as much as possible. Benefits achieved through ECE are assessed for their impact on human welfare and not for their impact the integrity of ecological systems.
- **Environmental Justice** – several, not necessarily complementary aims can be included in this goal: 1. Equitable distribution- where enforcement efforts aim to improve environmental conditions so both weak and strong segments of society enjoy similar conditions. 2. Equitable procedures- designed to ensure the equitable division of enforcement resources and equal access to the legal system in environmental matters. 3. Protection of the environment as a human right so that a basic standard of environmental quality is guarantied to all individuals, regardless of their social wealth and standing.

In order for ECE programs to achieve their goals, ECE actions must incorporate strategies for affecting behavioral changes in a way that makes them conducive to environmental objectives. This necessitates that human behavior and not only environmental, economic and social outcomes become a subject of quantifiable

measurement. Behavioral-indicators may serve as proxies for environmental outcomes when those have not been measured or when it is not possible to link environmental outcomes to enforcement measures.

Impacts of ECE may be assessed through indicators designed to measure deterrence based or normative based behavioral changes through outcome indicators. Deterrence can be judged by enforcement ability to create fear or by the degree to which enforcement outputs internalize the costs of non compliance. Normative change is judged by to the degree to which norm of compliance with the law have been internalized and public view of the legitimacy of environmental legislation has changed.

III. Enforcement Tools: Categorization and Conditions for Effectiveness

Potentially, a wide variety of enforcement tools may be available to ECE agencies. These range from inspection and monitoring tools, to sanctions to environmental remediation orders. The study gives a description of the various tools that have been employed in environmental enforcement throughout the world and describes the conditions for effective employment of each tool.

Figure 1: An Environmental Taxonomy of Enforcement Tools

Remediation	Environmental Damages Control	Environmental Damage Prevention
• Environmental remediation orders • Supplemental environmental projects	• Inspections and monitoring • Self-reporting • Administrative notices and hearings • Injunctions affecting the environmental management of the firm • Revocation or suspension of license • Property forfeiture	• Penalties (civil and criminal) • Personal liability and incarceration • Shaming • Denial of governmental support • Compliance assistance

Table 1 presents a summary of the necessary conditions for effective employment of enforcement measures according to the predefined enforcement goals.

Table 1: Variables determining the effectiveness of enforcement tools

	No.	Tool	Reducing Environmental Harm (a)	Advancing Environmental Justice (b)	Advancing Social Welfare (c)
Environmental Damage Prevention	F	Penalties and Fines	1. The fine is set higher than the gain to the offender divided by the probability of sanctioning 2. The probability of detection is high 3. The immediacy of the fine being imposed is high 4. The severity of the fine increases with criminal culpability 5. Fines are paid and collected	1. A higher fine is imposed when the transgression was committed in a disadvantaged area	1. The fine is set as a function of the harm divided by the probability of detection 2. Preference is given to administrative fines or civil fines over criminal fines
	G	Incarceration	1. Likelihood of use divided by probability creates substantial general deterrence 2. Use creates perception of severe sanctioning that boosts regulators' reputation creating implicit deterrence Impossible when: 1. Likelihood of use is extremely low	1. Incapacitation leading to preventing harm effecting disadvantaged communities is a consideration in imposing incarceration	1. The assets of the offender are limited 2. The probability of detection is very low 3. The offense has caused severe environmental damage
	H	Shaming	1. The social norm condemns the violation committed 2. The perpetrator is sensitive to social stigma associated with shaming 3. Precedence is given to imposing integrative shaming 4. The shaming is widely publicized and acknowledged	1. Prevention of harm to disadvantaged communities is considered in imposing shaming	1. When done at low cost

	No.	Tool	Reducing Environmental Harm (a)	Advancing Environmental Justice (b)	Advancing Social Welfare (c)
Environmental Damage Prevention	I	Denial of government support (i.e. preventing participation in tenders or revocation of subsidies)	1. The firm relies on government tenders or support 2. The amount revoked is substantial to the firm's economy 3. The revocation is accompanied by a demand for regulatory compliance	1. Prevention of harm to disadvantaged communities is considered in denial of governmental support	Is impaired when: 1. Competitiveness is negatively effected
	J	Compliance assistance	1. Environmental improvements made are linked to assistance received 2. Increases investments in sustainable technologies 3. Assistance encourages environmental innovation	1. Reduces capability and knowledge gaps between large and small firms 2. Resources are directed first at disadvantaged communities	1. Assistance increases information dissemination 2. Environmental results comparable to other enforcement methods are achieved at lower cost
Environmental Damage Control	K	Inspection & monitoring	1. Inspection probability is high (between 25%-40%) 2. Conducted in a scaled manner and based on risk assessment or prior knowledge of compliance 3. Unpredictable and irregular 4. Accompanied by real or perceived threat of sanction 5. Inspectors have relevant training and capacity 6. The integrity of inspections is scrutinized 7. Appropriate monitoring technologies are available	1. Based on risk assessment or prior knowledge of compliance 2. Conducted fairly and equitably 3. A greater percentage of inspections are conducted in disadvantaged areas	1. Inspection rates are low 2. Conducted in a scaled manner and based on risk assessment or prior knowledge of compliance 3. Unpredictable and irregular

	No.	Tool	Reducing Environmental Harm (a)	Advancing Environmental Justice (b)	Advancing Social Welfare (c)
Environmental Damage Control	L	Self-Reporting	1. Monitoring, data saving, and reporting requirements are clearly defined 2. Self-reporting requirements are adhered to 3. Enforcement producing a deterrent effect is employed against those who fail to report or falsify reports	1. The report requires reference to justice issues	1. Direct costs for monitoring by the regulator is high 2. Level of accuracy of regulator monitoring is low 3. Costs of inspecting and monitoring self-reporting is relatively low 4. Failure to report or accuracy problems are identified at low cost 5. Sanctions for non-reporting or false reporting are imposed at a low cost
	M	Administrative notices & hearings	1. A high percentage of cases are resolved and pollution abated without resorting to the courts	1. Use does not impair the fairness of the regulatory process 2. Use is equitable	1. A high percentage of cases are resolved and pollution abated without resorting to the courts 2. Costs of imposition are lower than legal sanctions 3. Use reduces firm's transaction costs
	N	Injunctions effecting the environmental management of the firm (i.e. corporate probation; mandatory Environmental management system (EMS)	1. The environmental benefits are greater than in conventional control tools 2. the purpose of the intervention is not solely to improve firm knowledge of regulatory demands 3. Not aimed at assigning blame 4. Entails a concrete course of action for environmental improvement 5. Corporate proba-tion is monitored by the courts 6. A formal EMS is adopted and fully implemented	1. Communities affected are considered	1. Net cost of implementing an EMS for the firm is lower than the social cost of non-compliance 2. Does not excessively interfere in the operation of the firm to the point of damaging efficiency

	No.	Tool	Reducing Environmental Harm (a)	Advancing Environmental Justice (b)	Advancing Social Welfare (c)
Environmental Damage Control	O	Revocation or Suspension of License	1. There is a valid license 2. Polluting activities are suspended as a result	1. Use and enforcement is fair and equitable 2. The will of the affected communities is given significant weight	1. The social benefits arising from the closing of operations are greater than the social costs
	P	Property Forfeiture	1. The property was used to create en-vironmental harm 2. If forfeiture prevents the persistence of harm 3. Reduces offender's income	1. Imposed in a fair process that allows for appeal 2. Distributional effects are not detrimental to those of low income	1. Benefits are larger than the social costs and do not hamper fair competition 2. Property will not be forfeited from those not involved in the offense
Remediation	Q	Remediation Orders	1. Imposed inall cases where remediation is possible 2. Special emphasis is given to environmental harms posing a high-risk level 3. Covers the environmental and health risks 4. Includes clear and concise instructions 5. Implementation is scrutinized by the enforcement agency	1. Imposed according to magnitude of environmental and health risks 2. Mandatory in low income areas	1. Social benefits are larger then costs 2. Allow for the use of the most efficient technology 3. Carried out by the most efficient party 4. Party carrying out remediation is reimbursed by the responsible party
	R	Supplemental environmental projects (SEP)	1. Proven substantial environmental benefits exist 2. Not a substitute for compliance with regulatory requirements 3. The responsible party does not profit from the SEP 4. Implementation is scrutinized by enforcement authorities	1.SEP Is related to the transgression 2. Lowers the probability of occurrence of similar transgressions in the future 3. Positively affects environmental and health risks in the area 4. Is carried out at the location the offense occurred or in the immediate vicinity	1. Social benefits are larger than costs

IV. An Assessment of the Use of ECE Tools in Israel

Several measures that have the potential of enhancing the effectiveness of ECE efforts in Israel have been found to be lacking or not sufficiently employed.

Tools that have not been *fully* utilized in ECE in Israel are:

- *Compliance Assistance* – Assistance programs extend ECE measures beyond deterrence and promote a normative approach toward compliance. These programs gather and distribute information about relevant technologies and means that may help companies meet environmental regulations and can assist small and midsize businesses comply with the law while also encouraging innovation and actions that extend beyond compliance.
- *Self-reporting* – Imposing self-auditing, self-monitoring and self-reporting, requires regulatees to monitor their activities and to provide enforcement agencies with information regarding their environmental impact. Research has indicated that self reporting may improve the ability to detect violations and to prevent their occurrence. Self-auditing and self-reporting requirements have yet to be incorporated extensively into Israeli legislation. Self reported information is not a substantial information source for enforcement officials.

Tools that have been *largely* overlooked in environmental enforcement efforts in Israel:

- *Supplemental Environmental Projects* – replacing the remediation of the immediate violation with another rehabilitation project, thus preserving the benefits of environmental remediation even in cases where the violation caused irreversible, irremediable damage.
- *Corporate probation* – legal intervention in corporate management requiring businesses to revise their environmental practices. For example, a court order may require a business adopt an environmental management system or appoint an environmental quality officer.
- *Shaming* – a host of shaming sanctions which include negative publicity, self-debasement and contrition. These sanctions are designed to shame offenders publicly, enticing them make normative change or enhance deterrence.

- *Revoking governmental support*- measures include withdrawing both direct support through such means as research grants or tax incentives or withdrawing indirect support such as participation in government tenders. These measures are administrative in nature requiring only minimal resources and may increase general and specific deterrence against firms found to violate environmental regulations.

Research results demonstrate that several other salient problems exist regarding the use of enforcement measures by the enforcement branch of the Israeli Ministry of Environmental Protection. These also negatively effect ECE effectiveness.

1. Fines

Fines are excessively used as sanctions in environmental violations. Between the years 2000 and 2006, fines were imposed in nearly 98% of criminal indictments that ended in convictions. Furthermore, environmental enforcement in Israel relies heavily on fine-or-trial penalties.[1] Nearly 100% of environmental violation cases that involved legal (as opposed to administrative) procedures were concluded with Fine-or-Trial penalties.

Both court imposed fines and fine-or-trial penalties are not determined according to an optimal penalty model (recovering damage or profits from non compliance divided by the probability that a fine will be imposed). As the fines do not even remotely reflect the environmental damages caused by the violations and do not negate the violators' profits, they are very unlikely to create deterrence.

The wide scale use of fine-or-trial penalties, which are similar in nature to administrative civil penalties, gives rise to the fear that the criminal stigma of penalties in ECE will be severely diminished.

The enforcement of penalty payments is lacking. Between the years 2000 and 2006, an average of 62% of fine-or-trial penalties were neither willfully paid nor sent for collection (10% standard deviation).

---

[1] These are criminal penalties imposed in lieu of an appearance in court. However, since violators are not required to appear in court if they decide to pay the fine, they have been perceived by the public as civil fines that attach carry no stigma.

The wide scale reliance on administrative penalties along with the fact that the penalties are not designed to recover the costs of rehabilitating the environment or voiding the profits of the violators effectively undermine the purpose of imposing penalties and their ability to create deterrence.

2. Incarceration

Between the years 2000 and 2006, prison terms were imposed only very rarely in environmental violation cases. Active prison terms were imposed in merely 1% of court convictions (1% standard deviation) and some 3% of cases ended with suspended prison sentences (2% standard deviation).

The miniscule use of imprisonment penalties in environmental violations renders this sanction effectively irrelevant.

3. Revoking Business Licenses

Between the years 2000–2006, an average of 5.5 administrative permit revocations (closing orders) were issued each year. These orders accounted for less than 0.5% of all administrative enforcement measures employed during those years.

In the same years, an average of 11 court-issued closing orders and suspended or immediate orders to halt operations were issued each year amounting to 9% of cases in which violators were convicted.

The use of both administrative and court-ordered permit revocations, has been negligible despite their extensive impact on preventing violations and deterring non-compliance.

4. Remediation Orders

Between the years 2000 and 2006 there was only limited use of remediation orders. An average of 107 site remediation orders were issued each year, no more than 14% of all administrative measures used during that period.

The courts impose site remediation orders in only a small percentage of convictions. This study found that between the years 2000—2006, for an average of 118 trial ending in conviction each year, only 5 remediation orders were issued amounting to 4% of such cases.

> Insufficient use of site-rehabilitation orders means that the environmental damages caused by most violations remain uncorrected. This fact severely impedes enforcement effectiveness.

V. Evaluating Enforcement Effectiveness

Because of their wide ranging actions, complexity and long term performance, it is suggested that ECE programs be evaluated through a purposefully designed "Goal Oriented Model" (GO Model) Index (indictor set) (figure 2). The GO Model aspires to be both generic and modular. It is conceptualized to be widely applicable, flexible and open to change. This approach is taken to avoid homogeneity, or a 'one-size-fits-all' approach, with regard to performance measurement. At the same time, the GO Model seeks to provide a common theoretical and pragmatic basis, that would allow the application of a core set of environmental compliance and enforcement indicators in different enforcement contexts.

The GO Model Index is grouped according to enforcement strategy, goals of environmental enforcement and central indictors chosen from a wider list of indictors according to selection criteria. These include: reflection of goals, replicability, methodological soundness, practical applicability and political acceptability. Each goal is allocated a weight and then indicators are allocated weights within their respective groups. These weights could be determined in an MCDA process and can be changed to reflect changing priorities. Third, each indicator is set a target. Forth, the indicator type is mentioned to relate the appropriate category from the logic model, allowing for a mixture of both input, output, outcome and results indictors. Fifth, the methodology type is briefly indicated.

Figure 2: GO Model

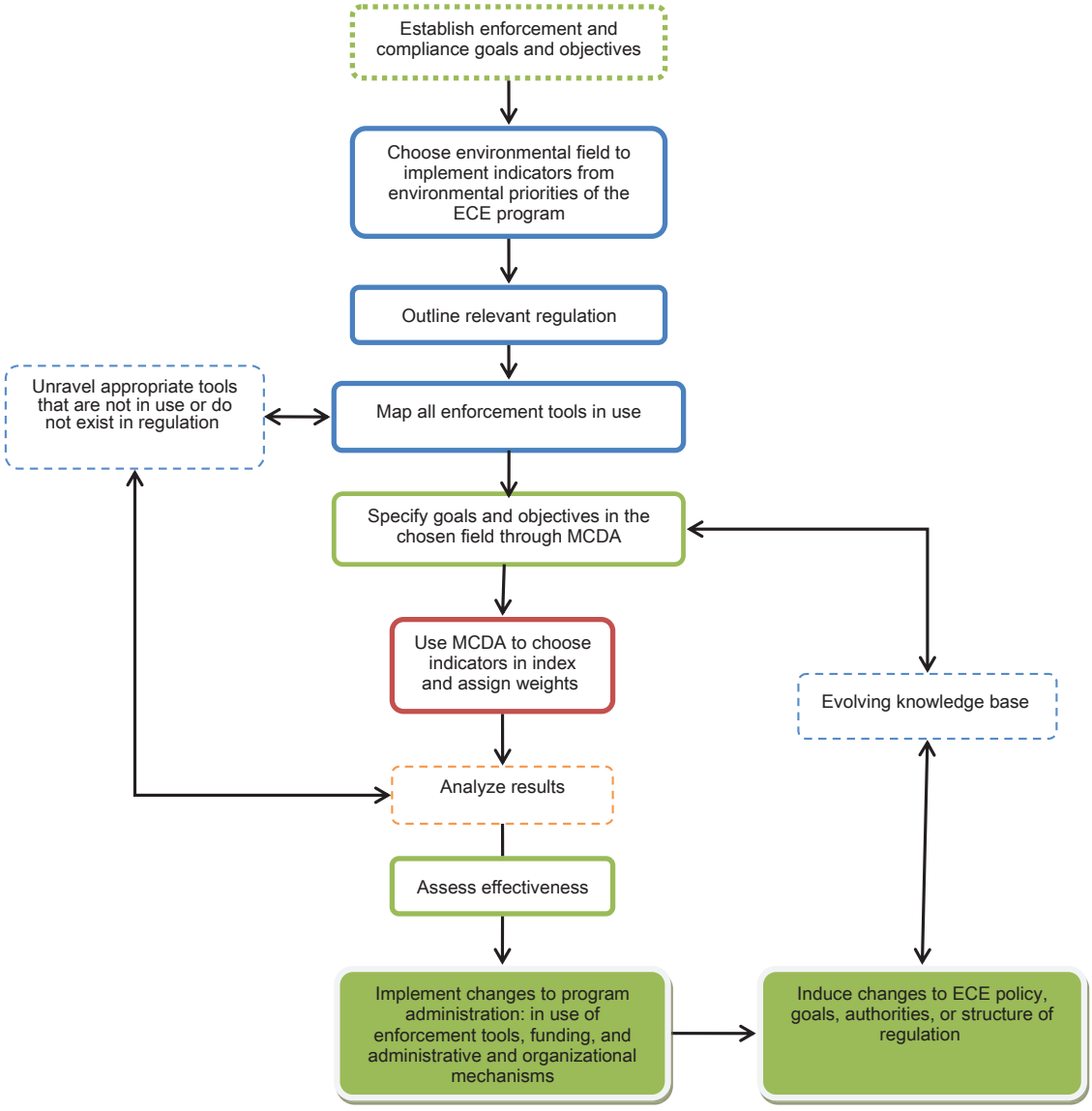

Table 2: A Sample GO Model Index

Goal/Strategy		No.	Name	Description	Target	Weight		Type	Methodology
Maximizing Environmental Results	**Environmental Damage prevention (through deterrence and normative strategies)**	A1	Ambient standard	Ambient standard as a percentage of regulative standard	100% of Ambient Standard or less	0.3	0.60	R	Quantitative
		A4	Probability of risk	Percentage of compliant facilities from general population of facilities	100% or more	0.2		R	Quantitative
		D4 or D5	Negating harm caused	Does the average sanction negate the average harm caused by the offenses in a certain class of offenses	100% negation	0.15		OP	Quantitative
			Negating economic gain	Does the average sanction negate the average gain in a certain class of offenses	100% negation			OP	Quantitative
		D7	Implicit deterrence	The subjective reputation of the regulator as a strong enforcer	100%	0.1		OC	Quantitative
		D8	Implicit deterrence	Percentage of firms reporting positive changes in response to regulators' reputation	100%	0.1		OC	Quantitative
		E4	Internal motivation/ commitment	Subjective level of commitment to compliance	80%	0.05		OC	Quantitative
		E5	Internal motivation/ action	Percentage of firms reporting managerial or behavioral changes in response to regulation (not enforcement)	100%	0.1		OC	Quantitative

Goal/Strategy		No.	Name	Description	Target	Weight		Type	Methodology
Maximizing Environmental Results	**Environmental damage control**	D3	Certainty of detection	Percentage of non-compliance detected as a result of inspections or self-reporting from total estimated offenses	30% detection	0.35	0.15	OP	Quantitative
		L(a)2	Self-reporting	Percentage of facilities adhering to self-reporting and self-monitoring requirements	100%	0.2		OC	Quantitative
		M(a)1	Administrative measures	Percentage of administrative measures to have brought about the cessation of non-compliance	100%	0.45		R	Quantitative
	Remediation	Q(a)1	Remediation	Percentage of transgressions causing damage in which remediation orders or SEPs were imposed	100%	1	0.05	OP	Quantitative
Maximizing Social	**Efficiency**	B4	Cost-benefit	Marginal benefit of pollution reduction compared to marginal cost of pollution reduction through enforcement efforts	Percent >0.1 or more	1	0.07	R	Quantitative
Environmental Justice	**Environmental Justice**	C5	PJ/DJ Social sensitivity of Enforcement Resources	Evaluating the allocation of enforcement resources according to socio-economic variables	Resources allocated in deprived region 100% or more of resources in non-deprived region	1	0.03	I	Quantitative
Overall index score									

Indictor Types are:
I – Input: Measuring resources invested.
OP – Output: Measuring activity levels
OC – Outcome: Measure behavioral dimensions
R – Result: Measuring environmental outcomes and impacts on the physical environment.

VI. Implementing the GO Model Index in Building and Construction Waste Violations

The index was applied to construction waste violations (fly tipping and illegal disposal) for the year 2006. From the implementation of the index lessons have been drawn as to quality of information on ECE collected by the Ministry of Environmental Protection, the organizational structure of ECE programs and the effectiveness of ECE actions in Israel.

ECE Information Gathering and Analysis: Facts and Lessons Drawn

1. *Data collection on waste disposal- Calculating Compliance*: Until 2005, data on the volume of waste disposal in official waste disposal sites was scattered throughout local government and regional offices. Data was also often incomplete. In 2006 the data collection process was greatly improved, information was consolidated and gathered in the central office of the Ministry of Environmental Protection for the first time, yet remained incomplete.

   Lesson: In order to assess the prevalence of environmental violations and evaluate the effectiveness of enforcement measures it is necessary to compile the data continuously, without interruption, and fully. The data should include the state of the environment and the measures taken to address the problems. Information gaps (such as the volume of waste buried in legal disposal sites) make it impossible to analyze the data and to arrive at valid conclusions regarding the effectiveness of enforcement measures.

2. *Data Collection on Waste Generation- Calculating Compliance:* The Ministry of Environmental Protection relies on general estimates for the volume

of construction waste annually produced. Several studies have suggested estimates of the extent of new construction, demolition, renovations and earth surpluses. However, in order to calculate the volume of construction waste annually produced, according to actual data and not general estimates, it is necessary to compile data on the extent of demolitions, infrastructure projects, IDF construction and other security construction, and interior renovations. This data is not compiled by the Israeli Central Bureau of Statistics or any other agency.

Lesson: Assessing ECE effectiveness requires near estimations of compliance and non compliance rates. This demands concise and accurate data both properly defined and collected in a timely and continuous manner. Without data on the extent of good behavior compliance cannot be accurately estimated. In order to assess the volume of non-compliance to building and construction waste regulations, data is required on both the volume of waste production and legal waste disposal and treatment. Data compiled on building construction in Israel is not sufficiently detailed to allow necessary calculations. As the volume of illegally disposed solid waste cannot be properly calculated, it becomes difficult, if not impossible, to accurately assess the effectiveness of enforcement in this area.

3. *Data Collection on Sanctions*: Data on "fine-or-trial" penalties (the predominant sanction in building and construction waste offences) is reliably updated in a computerized system. However, questionable data definitions within the system hamper the possibility of satisfactory data analysis, as violations are grouped together and not accorded a measure of severity or separated according categories readily transparent. .

   Lesson: The data required for implementing a GO index and assessing ECE effectiveness, must not only be continuously gathered but also meticulously predefined according to enforcement specific goals and indictor parameters in order to enable analysis.

4. *Data Collection on Administrative Enforcement Measures*: This data is routinely collected on outputs and partially on final outcomes and results. This includes partial information on the impact of enforcement on stopping

violations. However, the implementation status of remediation orders is not systematically monitored, so it is impossible to determine what stage the remediation is at.

Lesson: Data collection on administrative enforcement requires greater detail as actions are seldom finalized by a sanction. In order to evaluate the effectiveness of administrative measures both the process and outcomes of actions must be fully documented, in replicable form.

5. *Data collection on Inputs:* The Ministry of Environmental Protection's does not collect data on enforcement inputs and its budget is not sufficiently detailed for calculating the costs of enforcement measures in different areas.

   Lesson: Cost-effectiveness analysis requires analyzing inputs. Data on actual inputs must be rigorously collected and categorized in addition to increased budgetary detail that also improves transparency.

6. *Data Collection Defined by Indicators:* Data collection on ECE in the Ministry of environmental Protection was not systematically analyzed and has no intended relation to potential indictors on effectiveness. Therefore only a limited analysis of effectiveness can be conducted with existing or obtainable data.

   Lesson: Even relatively limited data may allow for partial Go Model Index implementation. Full implementation requires data be defined and collected according to indictor specification.

Recommendations on Required Changes in Data Collection:

1. Available data on ECE should allow Government to closely estimate compliance rates. Data should be defined and gathered accordingly.
2. Detail and continuity of data collection on ECE should be improved to enable evaluation of enforcement effectiveness.
3. Budget expenditure recording must be revised and detail added to allow an evaluation of enforcement cost-effectiveness.

ECE Organizational Structure: Facts and Lessons Drawn

1. *Assessing ECE Program Organizational Structure Through a GO Model Index:* The index does not include a full evaluation of organizational performance, but rather is limited to areas that have a fundamental impact on enforcement effectiveness

   Lesson: Fully assessing organizational performance in ECE programs requires a different approach to the one implemented in this study and can be aided by indictors not considered as core indictors for assessing effectiveness.

2. *Clear Definition of ECE Goals:* The Ministry of Environmental Protection has no published enforcement policy. Its ECE goals are not made public are not widely acknowledged, and do not retain the necessary clarity to direct enforcement actions. This was demonstrated through questionnaire responses by enforcement officers that expressed non- congruent views on enforcement goals and objectives .

   Lesson: As enforcement effectiveness is determined by the attainment of enforcement goals, the lack of clearly stated goals not only negatively effects enforcement effectiveness but also impairs the ability to evaluate enforcement process and performance.

3. *Integrity of Enforcement Staff and Process*: Integrity is a critical measure affecting ECE efforts. The Ministry of Environmental Protection does not audit its inspectors and does not have a transparent method of supervising inspections.

   Lesson: The fact that no standardized transparent method for auditing and supervising enforcement staff integrity is implemented, does not necessarily imply irregularities, however, if problems would arise they would most likely be left undetected.

4. *Analyzing and Using Indictor Information:* Indictor data cannot hope to effect enforcement effectiveness if the regulator does not adopt a reflexive learning process based on acquired information. Although some information on different aspects of ECE effectiveness were available to Ministry managers

and enforcement officials, information was not regularly or substantial used to promote reflexive learning and to drive improvements. For example, since 2003 the Ministry was aware of the fact that the system for collecting fine-or-trial penalties was not functioning properly. Nevertheless, the Ministry's administration made no effort to correct the situation, with one result being that the failure is listed as a central flaw in the 2008 State Comptroller Report.

Lesson: Using data for improving ECE efforts is no less important than properly managing the data.

Recommendations on Required Changes in Organizational Structure:

1. The Ministry should draft and make publicly available its enforcement policy and detailed ECE goals.
2. Establish a mechanism for overseeing and auditing inspectors' integrity and the quality of inspections and audits.
3. Reflexively evaluate enforcement performance through data. Use data and analysis on an ongoing basis to implement necessary changes to ECE program actions and structure.

ECE Effectiveness: Facts and Lessons Drawn

The following data and conclusions regarding the effectiveness of ECE in building and construction waste violations were derived from applying the index. Each indictor relates different information but, when used collectively the combined Go Model Index is a fair measure of overall effectiveness, as it integrates the relative importance of aims and goals.

Enforcement effectiveness in construction waste violations was found to be extremely low for various reasons. The most salient of these is the low level of inspection reliability and the size of the average fine which is far from removing the violators' profits. These two factors undermine deterrence effectiveness. Additionally, the low percentage of remediation orders bar any possibility of bringing about normative change through enforcement efforts and prevent the environmental benefit of enforcement from being maximized.

- In 2006 building and construction waste enforcement and compliance effectiveness was graded 23% out of 100%. Using sensitivity analysis, altering the relative weight of different indictors shows effectiveness may range between 22% and 36%.
- Of the estimated volume of solid waste produced in 2006, only 16% was disposed of legally. The disposal of 84% of waste was unregulated and found its way unlawfully to open spaces causing severe hazards and pollution.
- The reliability of inspections in construction waste violations is 0.1%, i.e. only 1 out of every 1,000 violations are detected and penalized. 405,000 construction waste violations are estimated to occur every year.
- The subjective inspections rate as viewed by the regulated parties, is much higher that objective levels and stands on 26.4%.
- The average judicial fine for illegal disposal of construction waste is 12,044 NIS – 4.4% of the maximum fine approved by law.
- The average cumulative fine (both fine-on-trial and judicial) for illegal disposal of construction waste was 1,664 NIS in 2006.
- The average weighted fine is equal to 0.22% of the fine that would be required in order to revoke the offenders' profits, and therefore has an insignificant effect on deterrence.
- Construction waste offenders tried in court are rarely required to counteract the damage caused by their violation. Remediation orders were imposed in only 5% of court cases and in an average of 0.7% from all punishable building and construction waste violations.
- The percentage of court decisions in which senior managers were convicted along with their company was high – at 78%.
- The percentage of administrative actions that had stopped ongoing violations was 38% (administrative actions include orders, warnings and hearings).
- Illegal dumping was found to be randomly dispersed, with not correlation to socioeconomic parameters of local authorities. This effectively means that construction waste offenses do not aggravate environmental injustice.

Recommendations on Required Changes in ECE Efforts:

Three alternative courses of action would improve the effectiveness of enforcement in the case of building and construction waste violations.

All options have various advantages and disadvantages. However, the third course of action seems most likely, as it is an effective, efficient and politically acceptable approach.

1. *Dramatically increasing the inspection rate as well as the average weighted fine*: This would require an increase of inspection rates to at least 5% of total estimated violation (50 times higher than the current rate of 0.1%) and would demand that the average fine be increased from 1664 to 16,400 NIS. These combined actions would remove the profit of fly tipping construction waste and would therefore constitute a deterrent effect.

   Disadvantages: This proposal has the significant disadvantage of requiring substantial investment of additional resources for the purpose of increasing enforcement probability. For this reason it will most likely encounter political opposition and may not be impractical;

   Advantage: Increasing the average fine to the proposed amount is not unreasonable and can be done a relatively no/low cost.

2. *Using available enforcement resources more effectively:*. In order to avoid a substantial increase in the resources invested in enforcement it is possible to take steps to increase the effective use of available enforcement resources. The first is to enhance the use of technological tools that might aid locating violations as they occur (for example, employing vehicle identification tools and satellite pictures) as well as enhancing the use of available methods (camera and aerial photographs). The second step is to focus enforcement efforts on against public officials in municipalities that have neglected enforcement of solid waste regulations in their area of jurisdiction. By focusing enforcement efforts on officials, who are particularly vulnerable to reputational concerns, deterrence can be increased without a significant increase in enforcement resources. The Municipal Council Act (Environmental Enforcement – Inspectors' Authorization), passed in 2008, has clearly establish the legal right

for the Ministry of Environmental Protection to press charges against mayors and regional council chairmen who neglect their enforcement responsibilities. Effective use of these clauses may strengthen deterrence by focusing on key figures which can then have a wider spillover effect.

Disadvantages: It is yet unclear to what degree the investment in technologies and enforcement against public officials can improve existing rates of deterrence;

Advantage: This approach requires much smaller investment compared to that necessary in order to increase inspection rates.

3. *Reforming the regulatory scheme*: The current widespread non-compliance culture and large numbers of violations is the main obstacle inhibiting the effectiveness of enforcement. In order to decrease the prevalence of construction-waste violations, a reform of environmental regulations is needed. Responsibility for the disposal of construction waste should be transferred from private contractors to local authorities (comparable to the removal of household waste). Placing the responsibility for the disposal of construction-waste on local authorities would greatly improve control over the process of waste removal and would prevent the widespread criminal violations currently prevalent. The transfer of responsibility would be accompanied by creating appropriate sources of funding for the treatment of construction waste by local authorities by imposing a tax for construction waste removal on contractors and builders.

   Disadvantages: Changing regulations as well as implementing changes may take an extensive period of time, and may encounter some political opposition from reluctant local authorities. Moreover, such an arrangement can only be implemented and enforced in cases construction waste is a product of building requiring a permit. Granting building permits may become contingent upon payment of the waste removal levy and use of a designated waste bin. This arrangement is more difficult to apply and enforce in building actions that do not require a permit (such as internal refurbishment work).

   Advantages: A subsequent decrease in the scale of violations and a significant improvement in the control of construction waste removal, will gradually permit a reduction in the level of necessary enforcement measures.

הגנת הסביבה היא יעד חיוני שחשיבותו מופרת היום היטב בישראל ובעולם כולו. מימוש המדיניות הסביבתית מותנה בחינוך לערכי הסביבה ובאכיפה יעילה ואפקטיבית. החתירה ליישום המדיניות הסביבתית ולהפעלה אפקטיבית של מנגנוני האכיפה היא אתגר מרכזי הניצב בפני קובעי המדיניות הציבורית בעידן המודרני.

ברם, כשמתגלע פער בין יעדי החקיקה לבין התוצאות בשטח, יכול פער זה להעיד על ליקויים באכיפה ועל צורך ברפורמה חקיקתית או בדרכי היישום. תנאי לרפורמה כזו הוא, בראש וראשונה, הגדרה ברורה ומדויקת של מטרות האכיפה וריכוז מידע מהותי ואיכותי על רמת הציות לחוק, על אופן הפעלת האכיפה ועל השפעת מאמצים אלה על הכפופים לחוק. רק בדרך זו ניתן לייעל את מערך האכיפה ולשפר את הציות לחוקי הסביבה.

מחקר זה מציג את הדרכים שבאמצעותן ניתן לקבוע במדויק את מטרות האכיפה. המחקר מציע דרך חדשנית לעיצוב מדדים אוניברסאליים שיוכלו לסייע בהערכת אפקטיביות האכיפה הסביבתית. מדובר בערכת מדדים מובנית שנועדה לבחון את ביצועי האכיפה ולסייע באכיפת החוק. המחקר מדגים את יעילותה של ערכה זו בתחום עבירות פסולת הבניין בישראל. באמצעות ערכה זו החוקרת בוחנת את אפקטיביות האכיפה המבוצעת בישראל נגד עבירות אלה וחושפת תמונה עגומה של אי-ציות ופגיעה קשה בסביבה ובשלטון החוק.

מכון ירושלים לחקר ישראל
בית חי אלישר
רחוב רד"ק 20, ירושלים 92186
טל': 02-5630175
פקס: 02-5639814
דוא"ל: machon@jiis.org.il
אתר האינטרנט: www.jiis.org.il

עיצוב העטיפה: www.saybrand.co.il

תמונות הכריכה באדיבות הציירת רות הורם