The Pollution Management Sourcebook is intended to be a living document. Please check the website: www.worldbank.org/environment/pomasourcebook for the most recent version.
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Acknowledgments

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This pollution management (PoMa) sourcebook has two major goals. First, it is intended to provide users with current information on available policy tools for pollution management. It is intended as a living document that will be improved over time through periodic review and be updated based on the lessons learned from its application. Second, the sourcebook puts forward the advantages of approaching pollution management through multiple stakeholders (each applying their own policy tools in parallel). Such collaboration can achieve positive outcomes more quickly and ensure a balance between, on the one hand, improved growth and competitiveness objectives, and, on the other hand, pollution management objectives that help to maximize public welfare. In other words, such a collaborative, balanced approach can achieve green and sustainable growth.

This PoMa sourcebook builds upon and broadens the scope of The Pollution Prevention and Abatement Handbook: Towards Cleaner Production (PPAH), published in 1998, and reflects the lessons learned from over ten years of experience and changes in the external environment. The PPAH has been enormously successful; it is widely used by many financial, private sector, government, and development institutions as a reference source for policy and technical guidance. Subsequently, in 2008, the industry-level technical guidance was updated and broadened in the World Bank Group’s Environmental, Health and Safety Guidelines. This sourcebook updates the guidance with respect to available policy tools.

The PoMa sourcebook is comprised of two parts. Part I, the User’s Guide, is divided into the following sections:

1. the objective, audience, scope and organization of the sourcebook;
2. the evolution to a multi-stakeholder approach, given historical developments in pollution management approaches in the last decade;
3. the conceptual framework of a pollution management system with multiple stakeholders and how it can be strengthened through “institutional leapfrogging;” and
4. a road map for users on how they can use the tools in the sourcebook to better manage pollution issues in a way that is consistent with “green growth.”

Part II of the PoMa sourcebook, Policy Tools, also referred to as the “Toolkit”, presents pollution management tools for different user groups, namely governments, private sector companies, financial institutions, the judiciary, and civil society. The users for this sourcebook are policy makers at different levels of government, such as ministers, vice-ministers, and city mayors, as well as chief executives of private companies and CSOs. This section is organized by the primary user of a particular policy tool, and presents a short, stand-alone guidance note on each of the twenty-three policy tools. Each guidance note contains the following components:
Getting to Green

1. an introduction to the tool;
2. a brief description of the tool and its application;
3. the prerequisite factors that are important to effectively apply the tool, including minimal institutional requirements;
4. the advantages using the tool, and its limitations (that is, when not to use the tool or what is not covered by the tool);
5. the interaction of the tool with other tools, and possible substitutes for the tool;
6. practical examples of the application of the tool; and finally,
7. references and resources that could be useful to practitioners applying the tool.

The User’s Guide, drawing upon the relevant literature, discusses and presents the following main arguments and concepts:

- In practice, pollution management takes place in many different geographical settings (for example, at the level of a factory, a water basin, a city, or a nation), and many stakeholders play a role in managing pollution in these settings (for example, stakeholders may include communities and civil society, local and national authorities and private institutions). The reasons for managing pollution can be quite different for different groups. For example, an Environment Ministry may focus on pollution management from the standpoint of maximizing citizens’ quality of life and society’s welfare. However, a private company could focus on managing pollution to minimize environmental risk, securing markets, or both. This sourcebook acknowledges that it is perfectly natural for different stakeholders to have different reasons to manage pollution, and hence derive different benefits. Therefore, the sourcebook makes the argument that benefits are maximized for all concerned if a user of this handbook can engage other groups as allies (by encouraging them to use their own policy tools in parallel) to facilitate the effort to manage pollution. These are often termed “win-win” actions.

- Pollution issues that result in a high social cost for the country can be termed “priority” issues. For such issues, it is important for a user of this handbook to engage other stakeholders on pollution management issues, even when there are opposing views on pollution management policy and implementation. This helps to ensure that several views are taken into account in policy design. Such an inclusive approach to viewpoints in turn helps to foster solutions that allow for both economic growth and pollution management (to maximize public welfare) in the medium to long term, rather than stalemate. The transaction costs of coordinating across multiple stakeholders can be high. However, these costs can be managed if there are effective conflict-resolution mechanisms in operation, and can be offset against the potentially significant benefits of resolving priority pollution issues.

- The User’s Guide also presents the conceptual underpinning of the approaches that are proposed for pollution management. The Guide highlights approaches that avoid short-term gains in either growth or pollution management, in order to prevent problems in the medium to long term; such approaches are characterized as “Green Growth”. Engaging inactive stakeholders in pollution management (at the level of any geographical setting, be it as allies or to advocate for one’s goals) helps to decouple growth and environmental degradation. The User’s Guide terms this “institutional leap-frogging.” The Guide also touches on Coase’s Theorem, which is consistent with this approach, and discusses how the context has evolved historically with respect to both evaluating benefits and related transaction costs, as well as defining property rights and why such an approach today is more valid in certain cases.

- The pollution management system in a particular geographical setting is comprised of many stakeholders and many tools that link in different ways. Together, these stakeholders and tools dictate the effectiveness of the pollution management system. The User’s Guide discusses how these
tools link with each other to help align incentives towards effective pollution management. The Guide also draws upon the business and environment literature to evaluate the experience to-date with both mandatory and voluntary tools, as well as sources of competitive advantage linked with pollution management. This literature points in particular to the effectiveness of tools that help to provide information, be it for consumers, for communities, for industries, or for government. It indicates how these tools can enhance the pollution management system, and shift it along a green growth path.

Finally, the User’s Guide discusses how the Toolkit can be used. It describes three approaches in detail, noting what the policy guidance notes can provide, and what is required on the part of the user, to derive the most benefit from the Toolkit.

- At the basic level, the policy guidance note on each tool presents recent information and lessons on the application of that policy instrument, and each note is intended as a quick source of up-to-date guidance for the policy maker or decision maker.
  - At an intermediate level, the Toolkit can be employed by an individual to better plan how different policy instruments can be used as a “package” to manage pollution and related environmental risks more effectively and efficiently.
  - Finally, the Toolkit can also be used at a strategic level to coordinate and plan for a more comprehensive approach involving multiple stakeholders to tackle critical pollution problems. At the strategic level, the Toolkit is more likely to be used by a multi-stakeholder task force (often, but not always, set up by the government), in order to address priority issues. These may have high social costs or limit growth in the medium to long term, and therefore require solutions that simultaneously emphasize economic growth, improve competitiveness, and maximize public welfare.
1. The Objectives and Scope of this Sourcebook

1.1 Introduction

This pollution management (PoMa) sourcebook is intended to provide users with current information on pollution management, including available policy tools for pollution prevention and resource efficiency. Part I, the User’s Guide, explains how these tools can be used to manage pollution and what the advantages and limitations are for different stakeholders in following such an approach. It makes the case that positive outcomes will come more quickly if different stakeholders each apply their own policy tools towards solving a common pollution problem (even if it is for very different reasons). These outcomes are also more balanced with respect to both improved competitiveness and pollution management.

The PoMa sourcebook builds upon and broadens the scope of The Pollution Prevention and Abatement Handbook: Towards Cleaner Production (PPAH), published in 1998 by the World Bank Group. At that time, the Bank’s approach to pollution had begun to shift away from pollution and waste collection and treatment, and toward a more holistic approach based on environmental management. As a result, the PPAH emphasized the role of an environmental agency in setting and enforcing standards for environmental management.

The PPAH has been enormously successful as a reference source for policy and technical guidance. It is widely used by many financial, private sector, government, and development institutions. Subsequently, in 2008, based on ten years of learning, the industry-level technical guidance (Part III of the PPAH) was updated and broadened, and is now referred to as the World Bank Group’s Environment, Health and Safety (EHS) Guidelines. The EHS Guidelines are comprised of over sixty industry-specific guidelines in sectors ranging from general manufacturing, to forestry, to mining, to infrastructure, among others.

This sourcebook provides updated guidance on available policy tools for pollution management, namely Parts I and II of the PPAH, reflecting the lessons learned and changes in the external environment in the last twelve years. Notably, this sourcebook shifts the approach on pollution management from an environmental management focus through primarily public regulatory instruments, towards an approach acknowledging that multiple stakeholders can affect pollution management (each through use of their own policy tools). The sourcebook emphasizes that applying these tools in parallel can help facilitate green growth, improved competitiveness, and ultimately sustainable development.

1. The PPAH consisted of three parts. Part I provided an overview of pollution management and a set of key policy lessons. Part II focused on policy implementation, particularly in air and water quality management and industrial pollution management, and examined basic principles, priority-setting, environmental funds, and global and transboundary issues. Part III focused principally on specific good practice guidance regarding acceptable emissions levels and pollutant control technologies for thirty-nine individual industry sectors.
1.2 Objective and Audience

The objective of this sourcebook is to provide users with current knowledge and information concerning the policy tools for pollution management that are available to them. It has therefore been structured so that each user group can navigate easily through the sourcebook, and review the policy tools that each group has at its disposal to better manage pollution. Further, the sourcebook also puts forward the advantages of a multi-stakeholder approach to pollution management in certain cases. This is intended to help ensure a balance between improved growth and competitiveness objectives, on the one hand, and pollution management objectives designed to maximize public welfare, on the other hand. That is, the sourcebook advocates an approach to green and sustainable growth. In doing so, the sourcebook explains how the same policy tools (available to each respective stakeholder group), appropriately implemented, can be used to advance an agenda that promotes green growth, firm competitiveness, and pollution management.

The audience for this sourcebook is (a) policy makers in developing countries, (b) top-tier domestic banks and domestic firms in emerging markets, and (c) staff of development institutions and bilateral agencies engaged in this agenda, as well as (d) consultants engaged in pollution issues with policy makers.

The focus on policy tools in this sourcebook is synergistic with the technical guidance in the World Bank Group’s Environmental Health and Safety (EHS) Guidelines, which provides technical guidance on good practices linked with specific project sectors.

1.3 Organization of the PoMa Sourcebook

The PoMa Sourcebook consists of two parts. The remainder of this part, the User’s Guide, does the following:

- presents the scope and organization of the sourcebook;
- explains the evolution to a multi-stakeholder approach over the last decade;
- describes the conceptual framework of a pollution management system with multiple stakeholders and how it can be strengthened; and finally
- provides a road map for users on how to use the tools in the sourcebook to better manage pollution issues in a way that is consistent with “green growth.”

The second part, Policy Tools, also referred to as the Toolkit, presents policy guidance notes on twenty-three key tools that different stakeholders have at their disposal to better manage pollution and shift towards a green growth approach. The contents of Part II are arranged by stakeholder focus, or user group, to highlight the tools at the disposal of the following stakeholders: the government; the private sector (including large, medium, and small enterprises); financial institutions; the judiciary; and citizens, including civil society organizations.

1.4 Scope of This Sourcebook

The focus of this sourcebook is on policy tools that enable multiple stakeholders to better manage environmental pollution, so that they in turn can better respond to the following policy challenges:

- Maximize public welfare (in particular by improving health outcomes linked with environmental factors and maximizing productivity gains).
- Maintain quality of life and basic human dignity and self-respect.
- Maintain competitiveness and secure markets by meeting buyers’ environmental demands.
- Promote environmentally and socially responsible investment.
- Minimize financial and reputational risk on investments.
- Ensure sustainability of activities by ensuring that the carrying capacity of the resource is not exceeded.
- Respond to national constitutions and comply with relevant international agreements and treaties.
A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness

This sourcebook therefore focuses on policy tools that help stakeholders to meet goals that are broader than just good environmental management. Subsequently, the sourcebook focuses on tools that provide for green growth, improved competitiveness, increased quality of life, and ultimately sustainability.

The term “pollution” in this document covers discharges and emissions to air, water, as well as land or soil, that result in changes in the quality of their resource. This pollution could potentially arise from any source, including households, economic activity, urbanization, industry, and agriculture. The policy tools described in this document allow stakeholders to manage the quality of the resource (namely air, water, and land) through (i) reducing legacy pollution, (ii) better managing and reducing current levels of pollution, as well as (iii) managing environmental risk to minimize or prevent pollution.2

At the same time, it is important to note what this sourcebook does not do. The sourcebook is not technical guidance that provides information on optimal standards or emission levels, nor on optimal quality of a resource, which are found in the EHS Guidelines. The focus of this document is on broad policy tools that complement the EHS Guidelines. The sourcebook does not highlight tools that are specific to a particular specialized type of pollution, such as the treatment of nuclear waste or the management of hazardous materials. Instead it focuses on tools that can be applied to better manage (and prevent) a broader set of pollutants that affect air, water, and land quality. This sourcebook also does not highlight tools that exclusively emphasize the optimal management of carbon dioxide and other greenhouse gas emissions. However, it is important to note that the policy tools presented in this document seeking to encourage reduction in energy use, raw material use, and emissions of local pollutants, also generally result in encouraging a reduction of greenhouse gas emissions. Finally, this sourcebook also does not focus on specific tools that affect occupational exposure levels. However, some of the tools described in it (such as environmental regulations or environmental management systems) are often used to reduce and better manage indoor pollution levels, and thus contribute towards reducing occupational exposure to pollution.

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2. It is important to note that “environmental management” is a broader term than “pollution management,” as it also includes a focus on management of the actual resource (for example, water resource management and land management). Pollution management, on the other hand, focuses in particular on management of the quality of the resource (for example, air, water, and land).
2. Evolution Towards a Multi-stakeholder Approach

As described earlier, the 1998 PPAH shifted the agenda on pollution management by arguing for the need to shift from pollution control to environmental management more broadly. In doing so, it emphasized the regulator’s role, briefly noting how voluntary initiatives by the private sector could also contribute to better environmental management. In this sourcebook, the emphasis shifts further to an approach recognizing that multiple stakeholders have a role to play in pollution management, and that the drivers for each of these stakeholders may be quite diverse (as described above). The rationale for this shift is discussed below by explaining the historical context.

This past decade witnessed a number of developments in the domains of environmental regulation and pollution prevention and abatement. A marked shift took place towards complementing the command and control and market-based instruments with community-based instruments (such as public disclosure programs). In 1995, Indonesia put in place a voluntary, pilot public disclosure scheme that encouraged firms to clean up their water pollution. The Program for Pollution Control, Evaluation and Rating (PROPER) required firms to self-report their water pollution levels, which were subsequently checked by the government’s environmental agency, and then assigned a color-coded rating (e.g., black for the factories that made no effort at control to gold for those that demonstrated adherence to international standards). The detailed findings were first shared with the companies, and, after a suitable retesting period, were made available to the public, thus bestowing either honor or shame on the rated factories and encouraging behavior change on their part to clean up their act. China followed suit with a similar program, Green Watch, in 2000, in which two Chinese municipalities established pilot programs covering 150 factories. In 2005, 20 municipalities adopted similar programs covering 8,500 factories. Research shows that the Green Watch program has significantly reduced pollution emissions in China. Today, similar systems are also in place in several countries, including India, Philippines, South Korea, Ghana, and Vietnam.

The past decade also saw an increase in awareness of environmental issues and heightened realization of environment as a human right. In 2001, the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters entered into force; and in 2003, the Parties adopted a Protocol on Pollutant Release and Transfer

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Registers (PRTRs). Passage of national Freedom of Information Acts (FOIAs) in many countries during this period also helped to improve transparency with respect to environmental information. Today, it is estimated that over eighty countries have enacted some form of FOIA, and the vast majority of these have been introduced in the past five or six years. This is an encouraging sign, even though practice often lags behind.

This period also saw an increase in judicial activity with respect to environmental matters. In that regard, India in particular has had some prominent cases, starting with the Delhi air quality ruling, which helped improve social accountability for a clean environment. In the early 1990s, an Indian nongovernmental organization (NGO) asked the Supreme Court to compel the Delhi government to enforce the clean air laws that had passed some fifteen years earlier. After a long and sustained campaign by the NGO, which used quantitative information on health damage effects, including estimated mortality rates, as well as an effective public awareness campaign through the press, in 1998 the Supreme Court issued its first comprehensive mandate for tackling air pollution, compelling the government to enforce its own regulations. Another important milestone linking constitutional human rights and the right to a clean environment was the 1994 ruling of the Pakistani Supreme Court in the case of Shehla Zia and others vs. WAPDA. In that case, the court concluded that the right to a clean environment is a fundamental right of all citizens of Pakistan, covered by the right to life and right to dignity under Articles 9 and 14 of the Constitution.


10. During this period, the International Finance Corporation (IFC) has experienced a sea change in environmental policy, with the sustainability agenda shifting to become a central pillar of IFC’s work in 2000. This is further reflected in IFC’s development and implementation of a new Policy on Social and Environmental Sustainability and Related Performance Standards in 2006, as well as on the portfolio front. For those performance standards, see: http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/pol_PerformanceStandards2006_full/$FILE/IFC+Performance+Standards.pdf. As these are dynamic processes, the new versions of the performance standards are due to become effective January 2012 with updated Equator Principles to follow.

Changes in the external environment have also helped to create different expectations with respect to pollution management. One of these external drivers has been increased urbanization, which has increased pressures on cities to tackle the point and non-point pollution sources in order to improve residents’ living conditions and quality of life. The example most quoted in this regard is the city of Bogota in Colombia. Bogota today has one of the finest (and best-known) examples of a bus rapid transit system (known as \textit{Transmilenio}) in the world. Less-known, but no less important, were the concerted efforts by two consecutive mayors of Bogota, Antanas Mockus and Enrique Penalosa, during the 1990s in leading an effort to change the face of their city to improve quality of life for their constituents. In the early 1990s, mimes at street lights emphasized the importance of obeying traffic signals. Later an advertising campaign raised awareness among city inhabitants about the health effects of air pollution, which included a higher incidence of cardiovascular diseases and cancers, in addition to the respiratory illnesses that most were familiar with. The introduction of an annual “Day Without A Car,” when citizens were asked to use public transport, or walk or bike to work, also helped to raise awareness. However, raising awareness was not enough. It was also important to provide alternative options for people, so that they could do something about their own habits. Investments were also made in an excellent bus rapid transit system, bike paths and pedestrian walkways. This focus on improving quality of life was not only directed to air pollution but to a more concerted effort across different sectors. Improvements in water and sanitation, upgrading inner city housing, and developing green areas for recreation were among some of the additional investments. These efforts changed the face of the city in a relatively short, 10-year period.

Finally, climate change has also been an important driver for many private sector companies to embrace a more sustainable approach. In the UK, for example, the private sector played a major role in supporting the government to advocate for climate change policies. Many UK firms have also effectively used the climate change agenda to highlight and enhance their own broader environmental sustainability practices, in order to both distinguish their own products from competitors as well as to provide information to consumers so they can better compare products. Marks and Spencer plc’s slogan of “Plan A, because there is no Plan B” is a classic example of this, together with their efforts to highlight environmental practices through improved product labeling.
3. Conceptual Framework of a Pollution Management System

3.1 The Stakeholders and their Individual Goals and Incentives

The historical developments described above strongly suggest that in reality pollution management (at any geographical level, be it within a factory, watershed, locality, city, national or global level) is a system with multiple stakeholders, each with multiple levers or tools at their disposal to effect pollution. The system is further complicated by the fact that these policy levers do not solely have pollution management as the main goal or derived benefit. In fact, there are several other goals and co-benefits, which sometimes are the drivers for use of the tool. The schematic diagram below illustrates this concept of a pollution management system.

The respective goals and challenges of the different stakeholders in this pollution management system are summarized in table 1.

As illustrated in table 1, different stakeholders can have very different incentives for managing pollution. These incentives range from maximizing public welfare from a government standpoint to improving competitiveness and securing markets for a private sector enterprise, to minimizing environmental risks in a portfolio for a financial

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**Figure 1. Schematic Diagram of a Pollution Management System**

- Between government and industry relationship not solely defined by regulation. In principle what is being advocated is that the relationship should be broader e.g., regulation, incentives, technology development and use, etc.
- Stakeholder relations not solely defined by pollution management.
- Relation between two stakeholders re pollution management defined by overlap.
- Points of common interest re pollution management for all stakeholders. In principle what is being advocated is that we should aim to maximize the size of the box of overlapping interests (even if motives are different).
## Table 1. Stakeholders in the Pollution Management System

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<th>Stakeholder</th>
<th>Role(s) Related to the Pollution Management System</th>
<th>Pollution Management Co-Benefit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Stakeholders</td>
<td>• All stakeholders are affected by pollution in air, water, soil.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Maximization of public welfare</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduction in reputational risks, and increase in reputational gains for para-statal corporations and joint ventures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Establishment of clear rules of the game for stakeholders often helps to attract new investment</td>
</tr>
<tr>
<td>Government</td>
<td>• Regulator (direct and indirect, e.g., through taxation, and self-regulator (in cases of para-statal corporations and joint ventures)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Promoter of good environmental performance (directly by industry, for example through tax rebates or indirectly through another stakeholder, for example public through public disclosure)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provider of basic infrastructure and services</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Maintenance of competitiveness and secure markets by meeting buyers’ environmental demands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minimization of financial and reputational risk through, for example complying with national and parent company EHS regulations, meeting potential financial investors’ environment-related requirements, and working with local suppliers to ensure raw material quality and minimize reputational risk</td>
</tr>
<tr>
<td>Private Sector</td>
<td>• Supplier of services or goods that are environmentally-sound or have been made in an environmentally-sound way</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Buyer of raw materials and other products that are environmentally-sound or have been made in an environmentally-sound way</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Community player—open and collaborative dialogue with local community</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure national law is followed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure international law is followed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Access to justice is available to all</td>
</tr>
<tr>
<td>Financial Institutions and Investors</td>
<td>• Financier of environmentally and socially sound projects</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promotion of environmentally and socially responsible investment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Minimization of financial and reputational risk on investments</td>
</tr>
<tr>
<td>Judiciary</td>
<td>• Indirect regulator through the tort system</td>
<td></td>
</tr>
<tr>
<td>Citizens and CSOs</td>
<td>• Buyer of products and services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Neighbor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Quality of life is maintained</td>
</tr>
</tbody>
</table>

intermediary or an investor. When different incentives for different stakeholders are aligned in applying several tools towards a common pollution management goal, these are often termed “win-win” options.

This is the case when the pollution management goal is to improve energy efficiency. When governments actively provide information and encourage (through market-based instruments) a shift to energy efficient equipment, then financial institutions can provide access to both credit and subsidized interest rates for this equipment. In this model, private enterprises can actively assess (for example, through an environmental management system) opportunities for improving energy efficiency and opportunities for switching to more energy efficient machinery.

The timing related to when benefits accrue is also important (the User’s Guide returns to this point in the next section). In the example above, for the individual private enterprise, there is a first mover’s advantage, since eventually all their competitors will also shift to the more energy efficient equipment. This effect could be even more pronounced for a large company that puts an EMS in place voluntarily, in order to respond to government enacting and actively enforcing environmental standards. It also facilitates their company to move towards compliance.
The financial stakes to align incentives for a private enterprise, however, are somewhat higher in the latter case, as the consequences of non-compliance are a potential shutdown of the entire company, compared with losing smaller amounts of money to poor efficiency and hence affecting competitiveness over a longer period.

The two examples above may suggest that it is only one stakeholder, namely the government, who takes the primary role in putting in place environmental management tools. While this is true in most countries, this is not always the case. Often large companies, particularly multinational companies, have taken on the role of encouraging the use of pollution management tools by the government, to develop a more equal playing field within which they can operate. There are examples of this with respect to liability legislation in Eastern Europe. Multinational companies, conscious of their environmental risks and subsequent effects on the potential market, have also demanded higher standards from their smaller suppliers. These companies have sometimes worked with governments to ensure that their tool-use and implementation align with their goals. Civil society has also been the stakeholder pushing for governments and private sector to take action in some cases. For example, this is often the case following environmental disasters.

### 3.2 Strengthening Pollution Management Systems through “Institutional Leapfrogging”

Aligning incentives and arriving at win-win options is important, but a better understanding of the real potential of a multi-stakeholder system for pollution management is only evident when it is not possible to align incentives in the short term. It is also evident when stakeholders feel that a particular policy approach of one stakeholder is at odds with the co-benefits sought by other stakeholders. Putting in place more stringent environmental standards could be one example of this. However, private sector firms may view such standards as limiting to their competitiveness in some markets. Another example could be a firm enacting a corporate environment and social responsibility program to gain investor support. However, such a program may be viewed as irrelevant by a local community, whose water supply is affected by the firm’s effluent discharges. In both cases, a discussion between the concerned stakeholders is important to reach agreement on how best to maximize both sets of co-benefits (firm competitiveness and public welfare). A formal mechanism to ensure that the debate can occur and be resolved quickly is also important, and a necessary feature of an effective pollution management system.

The best way to maximize co-benefits is therefore to involve many stakeholders in the pollution management system (within whatever boundary the system is operating in, for example, at the level of a firm, a waterbasin, a city, or a nation). This ultimately ensures that no one goal takes precedence over another at a cost to society, since these stakeholders act as checks and balances on one another.12

This approach is consistent with Coase’s Theorem and his emphasis on allowing all the stakeholders to negotiate directly, in order for them to reach the optimal solution, and as he wrote, “in devising and choosing between social arrangements we should have regard for the total effect.”13 Environmental policy students will also recall, however, that when Coase advocated such an approach, he himself acknowledged that two things in particular made it difficult to implement. First, it required property rights to be assigned in advance, but also he noted that the transaction costs of engaging stakeholders directly were extremely high. While this may have been true at the time, today several historical developments have helped to change the context in which Coase’s theorem is applied. Three aspects in particular have resulted in this paradigm shift. First, even though property rights over environmental media (air, water and land) are still not formally assigned, several court cases, including Pakistan’s case of Shehla Zia vs. WAPDA have helped to better define environmental rights as an extension of human rights. Second, with improved information access, transactions costs are lowered. Finally,

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the ratio of potential benefits to costs has also significantly changed. Initial application focused on accrual of local or national benefits. Today, the global environmental challenges faced, such as climate change, mean that the benefits of following a particular path are also potentially much higher. This also suggests that in some cases, the potential benefits could outweigh even potentially high transaction costs.

Further, ensuring that all stakeholders are active within the pollution management system offers an alternative approach to development than that proposed by the Environmental Kuznets curve, which suggested only two alternative pathways: pollute now, clean up later, or manage pollution, slow down growth. In the literature, it is suggested that leapfrogging through technology is the only way to bypass the Kuznets curve. This essentially happens when users uptake a newer, more efficient technology, while at the same time bypassing the use of a predecessor technology that others may have used. Essentially, a technology-shift occurs that helps to tunnel through the curve. However, the literature also acknowledges the importance of institutions in development. Thinking in terms of a multi-stakeholder model for pollution management suggests that there is also a concept of “institutional leapfrogging,” in which efforts are made to involve a stakeholder group not otherwise active in pollution management activities. This helps to shift to a new sustainable development or green growth pathway, or to tunnel through the Kuznets curve by ensuring that multiple goals (such as economic growth, improved competitiveness and pollution management) all remain high on society’s agenda.

If the stakeholder group is already a powerful actor, this could potentially lead to immediate results, but at the same time will require that a check also be put in place to ensure that all co-benefits are being maximized, and that the efforts are not just “window-dressing.” On the other hand, engaging stakeholder groups that have less power leads to a slower path towards strengthening the system and shifting to green growth pathways. However, this path is equally important, as in the optimal pollution management system all stakeholders are equally active and act as checks and balances on each other, maximizing all potential co-benefits.

This suggests that any effort to strengthen the pollution management system needs to actually build the capacity of the stakeholders, so that there is a balance of power between them. Building capacity can be through multiple means, but some tools appear to both affect pollution management and to indirectly help build the capacity of stakeholder groups to effect checks and balances in the system. Table 2 highlight which tools do this and how. As this table shows, these effects occur mainly through provision of information, putting in place formal mechanisms to engage different stakeholders and allow for forums of discussion, and finally putting in place mechanisms that allow for grievance redress or justice. Further, the table suggests that even though some tools inherently help to do this, other tools can also be designed in such a way that they facilitate capacity building of other stakeholders. One such example is a licensing system, which by itself does not strengthen capacity of non-government stakeholders. However, by ensuring that all licenses and their processing information is freely available, civil society and the private sector can act to seek redress if necessary, and hence ensure social accountability. Thus, having a transparent licensing process helps to ensure that the role of civil society and the private sector is potentially enhanced in the national pollution management system. Another important implication of table 2 is that it is not only suf-

16. A report from Calvert Asset Management Company, Inc. and The Corporate Library found that 65 percent of S&P 100 index firms and nearly one-fifth of Russell 1000 index firms have a corporate responsibility-related board committee, compared with only four percent of companies in the Russell 2000 index. Even where board oversight exists, however, companies often appear to view environmental and social issues in philanthropic or marketing terms, rather than as fundamental business risks or competitive advantages. This report can be found here: http://info.thecorporatelibrary.com/download-free-report-on-board-oversight-of-social-and-environmental-issues/?utm_campaign=UNPRI-press-release&utm_source=press%20release (accessed on August 23, 2011).
### Table 2. Mapping Policy Tools by Stakeholder and in Terms of their Potential to Engage Other Stakeholders

<table>
<thead>
<tr>
<th>Tools for use by</th>
<th>Guidance Note</th>
<th>Main purpose of the tool</th>
<th>Allows for access to information to at least one stakeholder</th>
<th>Facilitates participation among stakeholders</th>
<th>Allows for recourse to justice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic environmental assessment (SEA)</td>
<td>Incorporate environmental considerations, at early stages of decision making, into policies, plans, and programs that affect natural resources</td>
<td>Yes, if effort is made to allow for access to information</td>
<td>Yes, if effort to achieve participation is made</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Life cycle assessment</td>
<td>Assess a product’s total environmental impacts from raw materials extraction on through to waste management</td>
<td>Yes, if separate effort to share LCA results is undertaken</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Targeting legacy pollution</td>
<td>Set out the main steps and issues in initiating the process of addressing legacy pollution—any pollution that remains from past activities where there is no immediately responsible party</td>
<td>Yes, if effort to allow access to information is undertaken</td>
<td>Yes, only if participatory approaches are undertaken in addressing legacy pollution</td>
<td>Yes, if environmental liability legislation is put in place</td>
<td></td>
</tr>
<tr>
<td>Land use planning</td>
<td>Define land uses, establish where and how they occur, and effectively control their performance and interrelation</td>
<td>Yes, if effort to allow access to information is undertaken</td>
<td>Yes, if participatory approach to land use planning and implementation is chosen</td>
<td>Yes, if law provides for recourse to justice for land use violation</td>
<td></td>
</tr>
<tr>
<td>Industrial estates</td>
<td>Regroup industrial facilities onto a narrowly defined location to facilitate and promote industrial and economic development, and offers opportunities to improve the facilities’ environmental performance in a cost-effective manner</td>
<td>No</td>
<td>Yes, if effort to rely on participatory approach is made</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Environmental licensing</td>
<td>Regulate activities that may cause harmful pollution or environmental degradation</td>
<td>Yes, only if access to environmental licenses is covered by access to information law</td>
<td>No</td>
<td>Only when there is public access to environmental licenses and conditions in licenses</td>
<td></td>
</tr>
<tr>
<td>Market-based instruments</td>
<td>Use market signals to affect the behavior of both consumers and firms towards pollution, by implementing an explicit or implicit price on emissions to create financial incentives for pollution control</td>
<td>No</td>
<td>Yes, if trading rights and emissions are part of design of instrument</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Labeling and certification programs</td>
<td>Provide consumers with information about products that may help them to balance their environmental preferences with costs when they make a choice about a product</td>
<td>Yes, through the information that is contained in labels and certification programs</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Green public procurement</td>
<td>Incorporate environmental criteria in public procurement process</td>
<td>Yes, if access to information on green public procurement is promoted</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Environmental information disclosure</td>
<td>Provide rights to the public to access environmental information, which empowers the public to make effective and efficient decisions relating to environmental issues</td>
<td>Yes, as main mechanism of the tool</td>
<td>Yes, indirectly, because disclosed information could facilitate environmental activity by stakeholders</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Tools to encourage raw material and resource use, energy efficiency, and cleaner production</td>
<td>Initiate, stimulate and enhance the uptake of cleaner production concepts</td>
<td>Yes, if application specifically relies on information dissemination such as use of environmental labeling schemes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
## Getting to Green

<table>
<thead>
<tr>
<th>Tools for use by</th>
<th>Guidance Note</th>
<th>Main purpose of the tool</th>
<th>Allows for access to information to at least one stakeholder</th>
<th>Facilitates participation among stakeholders</th>
<th>Allows for recourse to justice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government</strong></td>
<td>Training and education</td>
<td>Develop an understanding and problem solving capacities of a range of sustainability, environmental and pollution management concepts</td>
<td>No</td>
<td>Yes, indirectly by enhancing capacity of recipients of training and education</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Setting priorities</td>
<td>Provide approaches and tools to determine priorities</td>
<td>Yes, only if access to information is specifically targeted through the process</td>
<td>Yes, only if stakeholder participation is specifically sought</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Environmental regulation and standards, monitoring, inspection, compliance, and enforcement</td>
<td>Set specific rules that authorize and control activities so that they operate within legally and socially acceptable parameters</td>
<td>Yes, in case of standards and regulation. For other elements, only if separate effort to allow access to information is made</td>
<td>Yes, if voluntary tools such as audit programs are used in conjunction with enforcement to engage private sector or if public disclosure programs are used in conjunction with inspection to engage communities and firms</td>
<td>Indirectly by providing benchmark (standards) that should be abided by</td>
</tr>
<tr>
<td></td>
<td>Environmental impact assessment</td>
<td>Incorporate environmental considerations into decision making on investments and projects</td>
<td>Yes, only if public disclosure is practiced</td>
<td>Yes, only if public participation is sought</td>
<td>Yes, only if legal provisions are in place to allow recourse to justice</td>
</tr>
<tr>
<td><strong>Private Sector</strong></td>
<td>Environmental management systems</td>
<td>Implement a structured program of continual improvement in environmental performance</td>
<td>Yes, only if public disclosure is applied</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Clean production management systems</td>
<td>Apply an integrated approach to business, driving enhanced material and energy efficiency while minimizing unwanted outputs</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Occupational health and safety</td>
<td>Foster a safe work environment, including the protection of employers, suppliers, customers, family members, nearby communities, and other members of the public who could be affected by a company’s operations</td>
<td>Yes, if effort is made to make access to information part of the tool</td>
<td>Yes, if participatory approach is sought in design and implementation of tool</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Supply chain management</td>
<td>Manage the sourcing and procurement of inputs, the processing and manufacture of products and services, and their delivery to the consumer</td>
<td>Yes, if effort is made to make access to information part of the tool</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Stakeholder engagement and grievance mechanisms</td>
<td>Build and maintain an open and constructive relationship with stakeholders and thereby facilitate and enhance a company’s or a project’s management of its operations, including its environmental and social impacts and risks</td>
<td>Yes</td>
<td>Yes, if participation among stakeholders is specifically sought</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Corporate environmental and social responsibility (CESR) programs</td>
<td>Implement a business approach embodying open and transparent business practice, ethical behavior, respect for stakeholders, and a commitment to add economic, social, and environmental values</td>
<td>Yes, if access to information is specifically targeted through the process</td>
<td>Yes, if participation among stakeholders is specifically sought</td>
<td>No</td>
</tr>
</tbody>
</table>
### Tools for use by

<table>
<thead>
<tr>
<th>Tools for use by</th>
<th>Guidance Note</th>
<th>Main purpose of the tool</th>
<th>Allows for access to information to at least one stakeholder</th>
<th>Facilitates participation among stakeholders</th>
<th>Allows for recourse to justice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Institutions</td>
<td>Role of financial intermediaries in pollution management: A risk management perspective</td>
<td>Inform financial intermediaries of their role in reducing pollution and managing other environmental and social impacts from a risk management perspective</td>
<td>No</td>
<td>Yes, only if participatory approach is sought</td>
<td>No</td>
</tr>
<tr>
<td>Judiciary</td>
<td>Pollution management tools for the judiciary</td>
<td>Ensure the rule of law in terms of pollution management</td>
<td>Yes, if access to information is specifically targeted through the process</td>
<td>Yes</td>
<td>Yes as direct objective of the tool</td>
</tr>
<tr>
<td>Civil Society</td>
<td>Public access to information for an active citizenry</td>
<td>Engage citizens and promote public action through increased access to information about pollution management</td>
<td>Yes, as direct objective of the tool</td>
<td>Yes, indirectly as important factor in meaningful participation</td>
<td>Yes, indirectly as a factor in facilitating access to justice</td>
</tr>
<tr>
<td></td>
<td>Advocacy and participation in decisionmaking for an active citizenry</td>
<td>Engage citizens and promote public action through increased advocacy and participation related to pollution management</td>
<td>Only as means to facilitate participation</td>
<td>Yes, as direct objective of the tool</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Ability to complain and access to legal recourse (public interest litigation cases) for an active citizenry</td>
<td>Engage citizens and promote public action through complaint mechanisms and increased access to legal recourse with regard to pollution</td>
<td>No</td>
<td>Yes, because legal recourse allows for participation of at least an additional stakeholder group in policy process</td>
<td>Yes as direct objective of the tool</td>
</tr>
</tbody>
</table>

Sufficient to design tools to enhance access to information, encourage participation, and allow for recourse to justice. These tools must also ensure that during implementation, these aspects are highlighted and encouraged, in order to realize the tools’ full benefits.

### 3.3 Applying the Conceptual Framework—Practical Examples and Lessons Learned

In practice, this pollution management system already exists in any geographical context. However, institutional and cultural context determine the relative power of each of the stakeholders in the system within its boundaries. This suggests that in order to move towards a green growth scenario, other stakeholders need to be actively engaged in the pollution management system in order to maximize co-benefits. Part II of this sourcebook therefore provides a more detailed approach to what exactly is needed, from an effectiveness stand-point, to strengthen these stakeholders and hence the pollution management system in a country for green growth. Yet this cannot be a cookie-cutter approach for all countries. This is because there is significant diversity in country situations with respect to the more and less powerful actors who are part of the pollution management system. Further, no particular country situation is optimal as a starting point, since very effective approaches to pollution management are evident in many different cultures and societies. What is important, however, is that the approach needs to work by taking account of the culture, rather than trying to impose solutions that may be optimal in a totally different cultural context. So what does it mean in practice?

It requires a policymaker to assess their current pollution management system in the context of its cultural context, including assessing the relative power of different stakeholders in the pollution management system. Checks and balances mean ensuring that all stakeholders have near equal power and activity within the pollution management system. Therefore, the next step is identifying which tools could be applied in order to increase the power of the less powerful stakeholders or the activity of the inactive...
stakeholders (even though they may already be powerful) so that a greater balance of power can be achieved over the longer term. Another way for a stakeholder to think about this is, how can one make sure there are multiple stakeholders who also have the same goal, namely green and sustainable growth, and to draw them into the system to support one's efforts. This is clearly a deliberate approach to strengthening the system over a shorter period than might happen naturally.

For a private firm, the incentives are different, but the final course of action remains the same, namely engagement with other stakeholders. The business and environment literature suggests that firm managers might systematically miss profit opportunities (for example, opportunities linked with reduced consumption or reduced use of environmental resources, or improved competitive advantage) due to lack of information-gathering systems as well as lack of market pricing of new performance criteria, which then leads to systematic underinvestment. This same literature shows that under certain conditions, governments and NGOs can provide an important stimulus for improvement, for example by increasing the flow of information available to managers to help improve their decision-making, or by negotiating mutually beneficial changes in corporate practice. At the same time, the emerging literature suggests that environmental performance improvements only pay for some firms, or only in certain cases or time frames. Real gains entail a change in the rules of competition, where clearly the government and national institutions play a major role. In other cases, the firms themselves set up self-regulatory institutions that evolve over time and support greener competition.

The conceptual framework proposed here may be new. Yet there are several familiar examples of both deliberate and not-so-deliberate approaches that have already taken place in different situations. These have led to a strengthening of pollution management systems towards a green growth path through “institutional leapfrogging.” Sometimes the trigger to make a change has come not as a deliberate attempt to strengthen the system, but as a result of broader changes in culture within society prompting the change.

Figure 2. Reinforcement through Multiple Policy Tools by Different Stakeholders Helps to Facilitate Desired Results

In other cases, it has come from self-regulatory institutions, often initiated by the private sector in response to different stimuli, which have evolved over time to involve other stakeholders to act as a check (primarily through information disclosure) and hence have helped the pollution management system shift to a new equilibrium towards a green growth pathway.


18. Ibid.
The classic case of involving another stakeholder group has been the efforts in several countries to engage the private sector in the pollution management system. Historically, the first examples of such engagement negotiated agreements between industry and government to improve environmental performance when standards were difficult to set. Through audit programs, they subsequently facilitated the firms involved to comply with environmental regulations and standards. An example of the latter approach was applied in Mexico in the 1990s. Stimulated by a major industrial environmental catastrophe in Guadalajara, the federal government created the Office of the Federal Attorney General for Environmental Protection in 1992, including the Office of the Deputy Attorney General for Environmental Audits. These audits were seen as a voluntary mechanism to assist industry in the highest risk sectors to resolve environmental challenges. Interestingly, it seems that participation was not entirely voluntary, as a review of the program by Blackman and others (2010) found that plants recently fined by environmental regulators were more likely to participate. In the first 5 years, audits at over 900 facilities were conducted, and then in 1997, public recognition was bestowed on the first 115 companies to complete actions plans developed as a result of the initial audits. This recognition was a mechanism designed to continue to engage these companies. There is no econometric analysis that assesses whether during the time the firms were engaged, their environmental performance improved. This is, in part, an assumption based on the fact that firms were implementing action plans to actively reduce environmental risk. However, the Blackman and others review of the first decade of experience found that results were not long lasting with respect to environmental performance improvements, in that after graduation from the program, participants were not fined at a substantially lower rate than non-participants. This emphasizes the importance of ensuring that different stakeholders (in this case, both government and private sector) remain engaged continuously in the pollution management system, and hence shows the danger of solely relying on voluntary approaches. It also shows that changing institutional culture, in this case promoting a culture of compliance among industry, takes considerable time.

Many governments have also successfully involved communities in the pollution management system to help with enforcement of environmental standards, and with assuring a check on the private sector, while at the same time engaging the private sector itself. The PROPER system in Indonesia (described above) was initially set up on a voluntary, pilot basis in 1995. Today, similar systems, which rely on using community-friendly coding approaches to highlight firm performance, are in place in many countries. A recent review by Blackman found that, overall, polluting plants in the program made significant improvements, thus suggesting that public disclosure schemes could be an effective strategy to support governments to enforce environmental standards. The literature shows that there are two underlying theories for the success of public disclosure schemes. The first suggests that communities and consumers exert pressure for the firms to clean-up. The second suggests that plant managers have more information, thus allowing them to respond better to cleaning-up pressure. Both theories are consistent with the concept of engaging additional stakeholders in the pollution management systems (be they communities or plant managers). Interestingly, a review of India’s Green Rating project by Powers and others found that plants located in wealthier communities were more responsive to GRP ratings. One hypothesis for this could be that these communities were in a stronger position with respect to seeking recourse to justice, and hence more influence.


Self-regulatory institutions have been created by firms for very different reasons, such as responding to crises (for example, the Responsible Care program adopted by the chemical industry following the Bhopal accident), or to credibly communicate the quality of their goods and services (for example, by setting up inspection and certification programs). A review of the literature about self-regulatory institutions by Berchicci and King suggests that often these programs suffer from a free rider problem, unless they include strong sanctions or can draw upon sanctions from another institution.24 The latter could be through government oversight, or in other words, another stakeholder stepping in to provide a check and thus help balance the system. There are also examples where the private sector has been the stakeholder most involved in the pollution management system, and where they have (indirectly) encouraged the government to take a more prominent role. This was the case in Chile prior to the passage of Environmental Assessment regulation in 1992, when mining companies, in line with their corporate requirements, prepared Environmental Impact Assessments (EIAs) and submitted them to the government. This was prior to the creation of a formal environmental institution, and lead in turn to the creation of CONAMA, a national environmental commission set up for the purpose of reviewing EIAs. Another classic case of involving another stakeholder group is that of the government working closely with the courts to ensure that environmental policies and standards are enforced. However, equally there are examples of the courts and civil society organizations coming together to ensure that the government better enforces its own regulations, as was the case in Delhi in 1998.

The above are all familiar examples of engaging (inactive) stakeholder groups in the pollution management system. This is an important first step. However, maintaining a balance of power among stakeholders is the key to an effective system that tunnels through the Kuznets Curve and allows for green and sustainable growth by ensuring that multiple goals (economic growth, improved competitiveness and pollution management) remain high on society’s agenda. This can be surprisingly difficult and clearly requires constant adjustment of the pollution management system over time, based on the differing involvement of stakeholders. This in turn suggests that tools related to information disclosure, that provide avenues for different stakeholders to participate and that allow for access to justice, are key for active stakeholders to both engage inactive stakeholders and provide a check on others.25 In theory, the use of these tools should provide a self-regulating mechanism for the system as a whole.

In developing countries, many of the tools that seek to engage other stakeholders (such as public disclosure programs and audit schemes) are often voluntary. The evidence from the literature shows that pure voluntary approaches are not sufficient, and in order to be effective need to be coupled with strong enforcement regimes, such as in Mexico’s Clean Industry program (described above). The exception seems to be programs that emphasize disclosure of information.26 Using our conceptual framework, this can also be explained as a voluntary approach placing too much power in the hand of one stakeholder group and not allowing for a check from another stakeholder group, unless there is some level of disclosure and recourse to justice, which provides a mechanism to ensure accountability. Furthermore, given the importance of these tools in the pollution management system to ensure checks and balances, pure reliance on a voluntary approach for their use seems inappropriate.

The tools for ensuring checks and balances also have to be commensurate with the culture and informal rules in a country. For example, there is little point in emphasizing litigation as the main way forward, or enacting stringent inspections and enforcement and expecting quick changes in the pollution management system, if there is no culture to do so. It is more important to consider short-term solutions while subsequently putting in place longer-term solutions that will influence and change informal rules in


25. Emphasizing dissemination of information is the key in voluntary regulation in developing countries to encourage polluting firms to participate and improve their environmental performance. (For example, see Blackman, A. 2008. “Can Voluntary Environmental Regulation Work in Developing Countries? Lessons from Case Studies.” Policy Studies Journal 36 (1): 119–41.)

a country. For example, in a country with poor enforce-
ment regimes and lack of a compliance culture, it may
be better to work with international buyers or through
trade regimes to engage industry and encourage clean
practices, in addition to providing both information and
wastewater treatment facilities in industrial estates, or in
special economic zones. At the same time, a longer-term
agenda needs to focus on improving information dissemi-
nation (for example through public disclosure schemes)
and ensuring that national regulations and standards are
appropriate and achievable in strengthening enforcement
regimes.

It is also important to realize that the pollution man-
agement system is not static, but is constantly evolving
based on history and current events. Often, disasters have
spurred or resulted in changed paths (such as the explo-
sion in Guadalajara or the chemical explosion in Bhopal).
Litigation also has helped to raise public awareness in
many countries. The impact on health and quality of life,
as well as raising incomes and expectations from citizens
has also influenced these systems. There is therefore a need
to continuously review the system over time, and to adjust
the tools within so that all stakeholders remain engaged
and are restrained by checks and balances. Balance implies
near equal power across all stakeholders. Equally impor-
tant is to reassess tools so that they remain relevant within
evolving cultural and development contexts. For example,
development of recourse to justice systems in countries
may mean that it is no longer necessary to link EIA proce-
dures with licenses (as is the case in some countries), but
rather to rely on the litigation system instead (as in the
USA context).

This discussion above also suggests that policy tools must
always be considered as part of a multi-tool system, not
individually. When putting these tools in place, stake-
holders must ensure that all elements of the “package” are
given equal attention (for example, emissions and ambient
standards plus enforcement plus legal redress mechanisms
or EIA administrative procedures plus standards plus legal
redress mechanisms). This means that EIA, for example, is
not an effective instrument unless it is linked to ambient
and emissions standards (against which the project can
be evaluated), and there is also a mechanism for redress
if the EIA does not meet these standards, or if there
are stakeholders who oppose it and can move to action
(beyond having their views heard). In the US for example,
the litigation system provides this opportunity. In Brazil,
the link of the EIA with the licensing system allows for
redress. This does not suggest that the tools should all be
developed at the same time. Rather, a process of prioritiza-
tion and sequencing of efforts would need to be applied,
which would differ by country and by issue, since differ-
ent countries will have different starting points in terms
of environmental governance and institutional contexts.
Prioritizing and sequencing would also prevent overloading
the human, technical, and financial resources of the
agency or agencies that are designing and implementing
the different tools.
4. Roadmap for Users on How to Use the Sourcebook

4.1 Content of the Toolkit

The policy tools section, referred to as the toolkit, presents short policy guidance notes on twenty-three key tools that different stakeholders have at their disposal to better manage pollution and shift towards a green growth approach. It is subdivided by user group to highlight the tools at their disposal, and facilitate navigation through the toolkit.

The tools are therefore grouped together in the following sections:

1. tools for government;
2. tools for the private sector (including large, medium, and small enterprises);
3. tools for financial institutions;
4. tools for the judiciary; and finally
5. tools for citizens, including civil society organizations.

For each of the tools, the policy guidance note presents the following information:

1. an introduction to the tool;
2. a brief description of the tool and its application;
3. the prerequisite factors that are important to effectively apply the tool, including minimal institutional requirements;
4. the advantages of using the tool, and its limitations (that is, when not to use the tool or what is not covered by the tool);
5. the interaction of the tool with other tools, and possible substitutes for the tool;
6. practical examples of the application of the tool; and finally,
7. references and resources that could be useful to practitioners applying the tool.

4.2 Use of the Toolkit

At the basic level, it is intended that the policy guidance notes on each tool are a quick source of up-to-date guidance for the policy maker or decision maker, reflecting recent information and lessons on the application of the policy instruments for pollution management.

At an intermediate level, the toolkit can be used by an individual user to better plan how different policy instruments (all under their own control) can be used as a “package” to more efficiently and effectively manage pollution and related environmental risks.

Finally, the toolkit can also be used at a more strategic level to coordinate and plan for a more comprehensive approach involving multiple stakeholders to tackle critical pollution problems. For the latter, it is more likely to be used by a multi-stakeholder task force (often, but not always set up by the government), in order to address priority issues that have high social cost or limit growth in the medium to long term, and therefore solutions are sought which simultaneously emphasize economic
growth, improve competitiveness and maximize public welfare.

The text section below describes each of the above uses in more detail and points out both what the policy guidance notes can provide, and what is required of the user, to derive the most benefit from the toolkit.

4.2.1 Basic Use: Accessing an Individual Note

In this case, a user may want to:

- Learn about a new policy tool that they are considering applying in their organization or at a public level.
- Understand better why a policy instrument that they are already using is not effective in solving a priority pollution problem, or in improving the effectiveness of a policy tool they are already using.
- Understand better how a policy instrument that they already have in mind may or may not be useful to them to solve an existing pollution management problem.

Basic use typically occurs when a user approaches the toolkit with a particular policy instrument in mind, and needs information related to the instrument in order to use it more effectively. In this case, the user turns directly to the relevant pages in the toolkit for the particular policy tool. The section on the interaction of a specific tool with other tools also allows the user to begin to use the toolkit at an intermediate level, as discussed below.

4.2.2 Intermediate Use: Putting together a “Package of Tools”

In this case, a user may want to:

- Address a particular pollution issue or reduce environmental risk, and wants information on the range of tools that they have at their disposal to do this.
- Understand better or assess their system of policy tools in place and consider how to improve their effectiveness.
- Improve the effectiveness of policy tools they are already using by ensuring a more effective linkage between different tools, or by adding additional tools that help to make the whole system more effective.

Intermediate use typically occurs when a user comes to the toolkit thinking about a particular pollution issue or risk, and needs information on all the policy tools that are available to them to resolve this issue. Tools are ultimately a means to an end or goal, and this approach helps to ensure the priority of the goal, rather than the tool. Intermediate use also occurs when the user desires to improve the effectiveness of the package of policy tools they already have in place such that these tools all strive towards solving the priority issue or risk. In this case, the user turns directly to the relevant user section in the toolkit that applies to them.

It is already well recognized that effective national pollution management systems need to comprise of a range of different types of tools, from command and control to market-based instruments to those that rely on sharing information, as the incentives to respond to different pollution sources can be quite different. Moreover, the lessons learned from experience of applying these tools, as documented in Section 3, suggests that policy tools need to always be looked at as part of a multi-tool package, so they can be more effective in addressing the priority pollution issue or managing environmental risks. For example, EIA is not an effective instrument unless it is linked to relevant ambient and emissions standards (against which the project can be evaluated objectively), and there is also a mechanism for redress if the EIA does not meet these standards, or there are stakeholders who oppose it and can move to action (beyond having their views heard).

This toolkit helps the user take an approach to pollution management that relies on a suite of policy tools to solve a particular pollution problem or risk, including improving resource use efficiency. This does not suggest that the tools

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should all be developed at the same time, but rather a process of prioritization and sequencing of efforts would need to be applied, which would differ by country, organization and by issue, since different countries and organizations will have different starting points in terms of environmental governance and institutional contexts. Prioritizing and sequencing would also prevent overloading the human, technical, and financial resources of agencies and organizations that are designing and implementing the different tools. At this stage, the toolkit does not provide particular advice on sequencing and prioritization of efforts, other than noting which other instruments must already be in place before the policy tool in question is effectively applied. For the most part, these decisions are left to the discretion of the user. It is intended that experience gained from the application of this toolkit will be reviewed periodically, and that such constant reappraisal will lead to inclusion of additional guidance on this subject.

The most strategic level of use of this toolkit is to shift from individual users using multiple tools (the intermediate case) to multiple users, using multiple tools, coming together to address critical pollution problems.

4.2.3 Strategic Use: Applying a Systems Approach to Pollution Management

In this case, a user may want to do the following:

- Address a priority pollution issue or significantly reduce environmental risks, and realizes that they cannot achieve this goal alone or cannot reach this goal fast enough through their own actions. They therefore need information on how other stakeholders’ tools can also help towards achievement of the goal. Alternatively, they need information on how they can engage other stakeholders to help them through application of the policy tools that are at their own disposal (for example, how can a private sector firm engage civil society through the firm’s application of its own tools).

- Address a priority pollution issue or reduce environmental risks, have already established a dialogue between multiple stakeholders, and want to map out the pollution management system together (namely, identify all relevant stakeholders and relevant policy tools that each could apply) in order to decide how to make existing tools more effective, or to identify new tools to be included in the system.

- Address a priority pollution issue or reduce environmental risks, so that the outcome is sustainable, namely in the medium to long term, and ensure that balanced solutions are sought which simultaneously emphasize economic growth, improve competitiveness and maximize public welfare.

Strategic use typically occurs when an organization, country, or society faces a critical problem that a single user group cannot solve unilaterally. It also occurs when a decision is made within an organization, country or society to make a transformational shift from one level of operation to a much higher one. The desire for this shift can occur for many reasons. A private firm may be interested in shifting to “world class” status or recognition. Alternatively, society may demand a shift in quality of life to a new norm due to rising incomes, or governments may decide to tackle pollution, as it is limiting growth due to excessive health costs, or due to a recent environmental disaster.

The conceptual framework in Section 3 suggests that for this type of transformational shift, multiple stakeholders bringing multiple viewpoints to the table are important, so that ultimately solutions emerge that are balanced in terms of design. There are multiple ways users can apply this sourcebook to engage multiple stakeholders. In increasing complexity, they are as follows:

- As a first step, the user should consult table 2 in the sourcebook to understand how they can apply their own policy tools to involve other stakeholders, before turning to the relevant policy note on that tool in the toolkit. This could be through making information available to the public, introducing mechanisms into existing tools that engage multiple stakeholders, or putting grievance redress mechanisms in place. Conflict reso-
olution mechanisms are particularly important, and should be considered a priority in order to resolve conflicts efficiently between groups when they occur. This helps to maximize the benefits of having multiple viewpoints, while minimizing the costs associated with deadlock resulting from multiple viewpoints. Again, table 2 shows which policy tools can be used in this way, to resolve conflicts.

Essentially, this approach is about involving other stakeholders as allies to facilitate the user's efforts, recognizing that they could have totally different reasons for moving in the same direction. These are often termed “win-win” actions. Examples of this might include governments encouraging the use of public disclosure schemes, in order to work with communities as allies to improve public welfare. Governments might work with the private sector by providing tax breaks for cleaner production equipment, or industrial estates that provide wastewater treatment facilities. Governments might also utilize tools such as strategic environmental assessment, to ensure that there is a structured dialogue with different stakeholders in designing new policies and programs. For firms, this could mean ensuring that environmental management systems are implemented with public disclosure, so that financiers can distinguish the lower environmental risks posed to them, and hence facilitate attracting additional or lower rate financing. It could also mean working closely with other firms through the supply chain to ensure that efficiencies are maximized, and hence firm competitiveness is enhanced.

- As a second step, the user can also turn to other users’ tools in table 2, before looking them up in the toolkit to learn more about them, and understand how they (the user) can actively engage in dialogue with other users through other’s tools. For a firm, this could mean actively engaging with a government to ensure that the rules of the game with respect to legacy pollution are applied equally across all entities. It could also mean engaging in the development or review of licensing procedures, to ensure that efficiencies are maximized (so that business development is not affected) and yet the government's goals are met. For governments, it could mean engaging with self-regulatory institutions created by firms to ensure there are strong sanctions for those who want a “free ride” at the expense of others. For civil society, one of the few government tools in the past allowing for stakeholder involvement in the pollution management system was environmental impact assessment (EIA). Today, there are many more government and other stakeholder tools (for example Strategic Environmental Assessment, SRI funds, public disclosure schemes) through which other civil society can also engage.

- The final way of using the toolkit is from a strategy design and planning standpoint. This is typically conducted by policy makers in governments, through review of table 2, along with the policy guidance notes, and is often intended to develop a systems approach to solving the priority pollution issue. This entails understanding the underlying incentives and roles of different stakeholders (table 1) and using this information to strategically design or strengthen (often an existing) pollution management system consisting of multiple stakeholders applying their own tools, in order to derive multiple benefits (for example see the schematic depiction on page 20). There is no recipe for this. It is based on the cultural context of the country and previous experience.

28. EIA is one such tool that has been used, in theory, this way in many developing countries, namely to provide a formal mechanism for different stakeholders to engage in projects with significant environmental impacts. Unfortunately, the participation part of EIA is also often the least effective part of the process in many developing countries, thus suggesting the EIA is not being used to its full potential.

and is as much an art as a science. The principles listed below remain important:
1. nurturing discussion;
2. respecting others’ viewpoints and understanding that they represent constituencies that are part of the system;
3. focusing first on tools that are win-win, where incentives are already aligned;
4. considering the timeframe of change and acknowledging that the process of change is also important in influencing the outcome; and
5. periodically reevaluating the results and adjusting course as needed.

The second part of this sourcebook looks at each of the tools available to different stakeholders in more detail. As stakeholders in the Pollution Management System review these tools and move forward to strengthen national environmental management systems, it will be crucial for them to bear in mind and apply this sourcebook in the different ways noted above, in order to shift towards a green and sustainable growth pathway, namely one that emphasizes economic growth, improved competitiveness, and maximizes public welfare.
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2.1 Governments
Strategic Environmental Assessment

Introduction

Strategic Environmental Assessment (SEA) is a set of analytical and participatory processes for incorporating environmental considerations, at early stages of decision making, into policies, plans, and programs that affect natural resources. SEA evaluates, at the highest strategic level, a project’s environmental impacts in the context of social and economic factors. This extends traditional Environmental Impact Assessments (EIA), which focus solely on physical environmental impacts. SEA fosters and provides critical systematic considerations at the sectoral, regional, and national levels to promote environmental sustainability, smart growth, and pollution prevention. The term “SEA” encompasses a spectrum of analytical processes such as Strategic Environmental and Social Assessment (SESA), Strategic Social Environmental Assessment (SSEA), Country Environmental Analysis (CEA), Combined Strategic Impact Assessment (CSIA), and Cumulative Impact Assessment (CIA).

Description and Application of Strategic Environmental Assessment

Strategic Environmental Assessment is not a “fixed, single and prescriptive approach” (OECD 2006, 17). It refers to a family of approaches that use a variety of tools, such as fiscal incentives, land use plans, and sustainable development policy. The “one size fits all” approach is not applicable to SEA. Effective SEAs adapt to fit the context and conditions of the project. They must incorporate the cumulative environmental impact of multiple simultaneous projects proposed by a development plan.
Developing a successful SEA requires resourceful and proactive behavior to seize opportunities for influencing policy. Incorporating environmental sustainability considerations into a project is an ongoing process. Ideally, this process should start at the earliest phase of project formulation, extend through the implementation phase, and conclude only after full monitoring of the complete project has been achieved, as seen in box 1. To accommodate these developments, it is crucial to maintain an open dialogue through every stage of a project.

The two distinct approaches to an effective SEA are impact-centered and institution-centered. The context of the development goal determines which approach is most appropriate.

**Impact-centered SEA approach.** An impact-centered SEA approach focuses on the physical and human impacts of a proposed development plan. Physical impacts include infrastructure projects and land-use change. Human impacts include promoting economic growth or health and safety. For an impact-centered SEA approach, the decision-making criteria focus on incentive systems and institutions conducive to attract investment, encourage savings or consumption, and promote exports. A critical component of an environmental assessment is to properly analyze the environment to optimally manage growth at a sustainable rate.

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**Box 1. Strategic Social Environmental Assessment (SSEA) of the Power Sector in the Nile River Basin**

Uganda and the rest of the Nile Equatorial Lakes (NEL) Region of Eastern Africa have experienced an acute lack of electric power. Additional low-cost power generation and an efficient regional electricity trade are development priorities. The World Bank supported the preparation of a Strategic Social Environmental Assessment (SSEA) of major regional power development options and regional transmission interconnections in the NEL Region. The assessment, which covers Burundi, the eastern region of the Democratic Republic of Congo, Rwanda, Kenya, Tanzania, and Uganda, proposed a power development strategy and an indicative development plan to the year 2020. Bujagali Falls on the upper Victoria Nile in Uganda has long been considered for hydropower development, and in the SSEA analysis emerged as the highest development priority for Uganda. The SSEA also assisted hydropower development in the NEL region by addressing the risk of drought over the lifetime of the Bujagali project through a detailed analysis of climate change and its potential impacts. The analysis shows that with rising temperatures due to global warming, precipitation and net runoff will both increase, as will the losses due to evaporation and evapotranspiration. Yet, it also finds that climate change may increase runoff for Bujagali and consequently provide a higher potential for power generation. Furthermore, Bujagali Energy Limited (BEL), with IFC’s financial support, developed the 250-megawatt Bujagali Hydropower Project. Building on the SSEA’s results, the project undertook sectoral and cumulative analyses to strengthen the project’s social impact assessment and its Environmental Impact Assessment (EIA).

The SSEA provided key regional and sectoral information on the environmental sustainability of the Bujagali project. In reviewing this project, which had not been free of controversy, the World Bank’s inspection panel stressed, among other things, the importance of enhancing the integration of the SEA’s results in the project’s EIA to improve information disclosure, public consultation, and decision making.

Source: Bujagali Energy Limited environmental documentation at [www.ifc.org/disclosure](http://www.ifc.org/disclosure) and Inspection Panel 2011.
**Institution-centered SEA approach.** An institution-centered SEA approach focuses on a project’s managing body. Techniques from environmental economics, policy economics, institutional management, political science, and sociology are appropriate for this form of SEA. An effective institution-centered SEA highlights the proper management techniques to sustainably implement a development project.

**Combined SEA approach.** A comprehensive SEA will include strategy from both the impact-centered SEA approach and the institution-centered SEA approach. Project conditions will determine which methodology is most pertinent. For example, an SEA for a hydroelectric power plant will be developed using an impact-centered approach. It will focus on the environmental impact of the proposed construction and operation of the hydroelectric project and the economic impact of the electricity production. In contrast, an SEA for air pollution policy will be developed using an institution-centered approach. It will focus on the roles of stakeholder groups, such as industry and local residents, and the policy challenges presented when new air pollution regulations are implemented.

**SEA analytic proces.** A comprehensive SEA demands a thorough analytic effort. The analytical framework provides decision makers with the information necessary to make informed decisions. This information focuses on the environmental benefits, consequences, and risks associated with a variety of policy and program options. The analytical work includes alternatives and proposals to mitigate potential damages and minimize risks associated with a project. SEA analytical work can be summarized by five steps, which are illustrated in figure 1 and described below.

**Figure 1. Analytical Work Schematic**

1) **Identification of Environmental Priorities** This process will provide a compilation of existing key environmental issues in the sector or region that will be affected by the policy. Their interrelationship with economic and social priority issues should be discussed to clarify how environmental priorities are linked to growth and poverty alleviation. A complete compilation will examine preexisting private sector projects and the standards by which they operate.

2) **Stakeholder Analysis** This process will assess who benefits from or is adversely affected by both the current situation and the potential development project. It will analyze the vested interests, power asymmetries, and impediments to collective action of affected stakeholders. A complete and
A comprehensive analysis of all potential stakeholders is a critical component of an SEA.

3) **Assessment of Institutional and Capacity Gaps** This process addresses the environmental priorities for the next step. It will include an assessment of the extent to which the proposed policy may aggravate or please the stakeholders. A full assessment will consider potential stakeholder responses.

4) **Policy Recommendations, Institutional Strengthening, and Capacity Building Recommendations.** This process addresses the institutional and capacity gaps identified in step 3. Policy recommendations should be sorted into three categories, short term (1-2 years), medium term (3-5 years), and long term (greater than 5 years). Each recommendation must include monitoring indicators.

5) **Political Economy Assessment of Proposed Adjustments** This process addresses the recommendations from step 4 and analyzes their impact on the political and economic environment. The assessment completes the first cycle in developing an SEA report.

The second and successive cycles of an SEA resemble a quality management cycle. In following up the implementation of the SEA recommendations, environmental priorities should be revisited. If new priorities are detected, a new cycle of assessment and recommendations as depicted in the figure above should follow. In this way an incremental and continuous improvement of the environmental sustainability of policy formation is fostered.

**SEA public participation process** SEA is a mechanism to engage all key stakeholders that will be potentially affected by the proposed policy. There are two main potential development benefits of opening development decision making to all affected parties. First, the voices and interests of weak and vulnerable stakeholders can be heard and influence the decision-making process. Second, public participation creates increased accountability for the policy makers.

Both of these outcomes enhance environmental governance. Furthermore, public participation strengthens democratic institutions by reducing the ability of vested interests to misrepresent their interests as those of the public at large. Figure 2 summarizes the main phases of effective public participation in SEA and the phases are briefly discussed below.

1) **Stakeholder and Political Economy Analysis** This process is detailed above and insures a complete understanding of power differentials and cultural factors that can affect the quality and contribution of public participation.

2) **Selection of Public Participation Mechanisms** This process addresses potential mechanisms for dialogue. It must include political and cultural constraints affecting a particular society. Mechanisms may include, but are not limited to workshops, focus groups, surveys, and ethnographic field research. Mechanisms are selected to minimize and control for the bias that political and cultural factors may impose on the dialogue. Successful mechanisms will open a
3) **Dialogue Adaptation to the Complexity of Decision Making** This process allows policy makers to interpret and prioritize results from the dialogue discussion to fit the development goals. During this process all stakeholder opinions will be considered as valid and adapted as needed to most appropriately fit the context of the project.

4) **Engage Stakeholders in the Follow-Up and the Implementation** This process keeps the dialogue open between project developers and policy makers, and the stakeholders. After policy and project decisions are made, stakeholders must be informed in a comprehensive manner so they understand the reasoning for the decisions. At this stage stakeholders should voice their opinions on the current policy and project draft.

This four-part public participation process reinforces the SEA dynamic of a continuous adaptation to the sector’s environmental priorities. Furthermore, SEA assesses historical, cultural, institutional and systemic conditions affecting environmental and natural resources management that cannot be addressed at the project level. In this way, SEA helps manage systemic environmental risks. If these conditions are not taken into consideration in the design and implementation of programs, plans, and policies, then society’s welfare will suffer from environmental and natural resource degradation and lowered growth rates.

Figure 2. Public Participation Schematic

Narrowly defined, the target audiences for SEA are decision makers at the planning and sectoral ministries; local, regional, and national authorities.
with planning and policy responsibilities; and multilateral development groups. While the priority of these audiences cannot be denied, civil society organizations, policy communities, the private sector, and the media are also audiences of SEA due to their interest in sound environmental management, enhanced governance, and sustainable development. In Box 2 hints for having the buy-in of SEA from this broad audience are provided.

Box 2. Getting the support of stakeholders to the policy-SEA process

- SEA is linked to economic growth, social development and/or poverty alleviation imperatives
- Stakeholders select SEA priorities, validate the institutional analysis and endorse the SEA recommendations
- SEA Action Plan involves stakeholders in following-up and monitoring

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<th>Public Sector</th>
<th>Civil Society</th>
<th>Private Sector</th>
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<td>- Sector/sub national authorities led the SEA process</td>
<td>- SEA’s objectives, phases, intermediate outputs and expected outcomes are known and agreed in advance</td>
<td>- A framework for local/regional sustainable development is facilitated by the SEA involving local communities, the private sector and national and subnational governments</td>
</tr>
<tr>
<td>- An intersectoral committee to steer the SEA process is effectively (not formally) established</td>
<td>- SEA public participation plan is agreed early on in the process</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration based on a review of a number of SEAs undertaken or supported by the World Bank.

SEA at the policy level can be applied by governments as part of their preparation of policy reforms, development strategies, and high level plans and by donors, mainly in coordination with governments, as part of their assistance to developing countries. Key sectors where SEA has been used are among others natural resource management, particularly forests, environmental management, extractive industries, basin management, energy and transport. Its potential for application is, however, broader comprising trade, industrial policy, urban planning, climate change, national level overarching strategies and plans, national policy reforms and budget support programs. Industries and firms may also be interested in policy-SEA as it enhances the legitimacy of sector reforms and strengthens pollution management policies. For instance, critical environmental issues for firms’ competitiveness such as those related with water access and management can be better addressed at the basin than at the project level. Also, information on environmental priorities and policy alternatives discussed in policy-SEA would be a useful input to firms’ strategies or planning.

**Prerequisite Factors for Strategic Environmental Assessment**

Planning or policy competency, implementation capacity, and a tolerant society are the three necessary
factors that must be in place to successfully implement an SEA.

**Planning or policy competency.** The critical prerequisite for SEA is that the organization that will undertake the SEA must have the planning or policy competence on the sector or theme that will be subject to the SEA. This organization should have the formal responsibility and powers to implement the SEA and sustainable options that come out of it.

**Implementation capacity.** Another prerequisite is that the organization should have the capacity to implement the SEA’s recommendations. Usually, these recommendations pertain to widening the scope of their practice beyond their formal (and therefore narrow) responsibilities – taking alternative strategic options into consideration that normally would not be in their scope but in that of others. The organization, therefore, must be able to cooperate with other government organizations that have these responsibilities. When this prerequisite is not fulfilled, the SEA would need to promote interinstitutional arrangements like the creation of intersectoral committees to allow cooperation and joint working across more than one organization, as in the SEA for the tourism reform in Mexico and the SEA for the mining sector reform in Sierra Leone (see Table 1). The challenge here, for which there are no recipes, is to promote joint ownership along with separate sector accountability.

**Tolerant society.** The importance for effective SEA of an open society that can tolerate criticism and opposition to the prevailing policy and planning views cannot be understated. When these conditions are lacking or are significantly constrained, the effectiveness of SEA suffers. Likewise, societies where social or gender discrimination limit the participation of weak and vulnerable groups will also limit the effectiveness of SEA. In these cases SEA practitioners should strive to elicit the views of excluded or discriminated groups in any lawful way possible. Ultimately, SEA is a tool for strengthening governance and state building but, no matter how well implemented, SEA cannot be a substitute for a long-term comprehensive strategy for enhancing governance. The initial governance conditions prevailing in a country are, therefore, critical for effective SEA.

**Advantages and Limitations of Strategic Environmental Assessment**

The use of SEA has numerous advantages:

- Raise attention to key environmental issues
- Assess capacity gaps and institutional effectiveness
- Provide a forum for discussion and information sharing for decision makers and stakeholders
- Assess the interplay of interest groups to keep the status quo or to promote greater environmental sustainability by addressing key environmental issues

The benefits of SEA vary over time and largely stem from the process that it sets in motion. In the short term, SEA provides key information to assess the environmental risks and opportunities associated with alternative government interventions and the existing capacity to manage them. It also provides a platform of dialogue to consider the environmental
implications of these interventions along with mechanisms to reach agreements on priorities and proposed actions. In the medium and long term, as the SEA process becomes engrained in the planning and policy culture, it enhances environmental governance by strengthening environmental constituencies, and promoting institution building, transparency and accountability of decision making.

SEAs also have several of limitations:

- Experience in using SEA is limited compared to EIA and experience in using SEA at the policy level is modest compared to SEA of programs and plans
- Political pressures can reduce the effectiveness of SEAs
- Require an effective system of checks and balances to insure political biases are not introduced

**Interaction with Other Tools and Possible Substitutes**

SEA is closely related to other environmental, planning, and policy appraisal tools. For environmental assessment or analysis, SEA complements and extends the assessment of the physical environment performed in an EIA. Yet, unlike an EIA, which is tied to a go-or-no-go decision, SEA is an iterative process of assessment and reassessment. Additionally, SEAs address technological, economic, social, and institutional changes, and environmental management systems. SEA borrows the methods for stakeholder and political economy analysis, and for public participation, from poverty and social impact analysis, and from political economy. Other tools with which SEA can interact are land use planning, cost-benefit analysis and life cycle analysis.
Practical Examples of Strategic Environmental Assessment and Lessons Learned

Table 1. Benefits and Methodologies of SEA for Sectoral Policy Reform and Planning

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Mining policy reform in Sierra Leone</th>
<th>Tourism reform in Mexico</th>
<th>Environmental reform in Colombia</th>
<th>Lao PDR’s Hydropower Development Plan (related to the Nam Theun 2 Project)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of SEA</td>
<td>SESA</td>
<td>SEA</td>
<td>CEA</td>
<td>CIA</td>
</tr>
<tr>
<td>Significant contribution (Benefits)</td>
<td>Preparation of technical assistance project, including (i) strengthening of Sierra Leone’s environmental agency and the environmental unit in the Ministry of Mineral Resources, (ii) supporting capacity building of mining communities, and (iii) improving regulations on resettlement, reclamtion and EIA. Project preparation and implementation on “Strengthening Community-Level Accountability in Sierra Leone’s Mining Sector.”</td>
<td>Policy for sustainable development for tourism and development of “Mexico clean and beloved” campaign Improved collection and dissemination of data relating to existing tourism demand and supply to facilitate planning for sustainable tourism; Development and updating of land use plans; Strengthened institutional framework that promotes interaction among all stakeholders; Development of fiscal incentives to promote innovation and environmental sustainability</td>
<td>Preparation of Development Policy Loan Program and Technical Assistance project to (a) improve the effectiveness and efficiency of Colombia’s National Environmental System, and (b) integrate the principles of sustainable development into key sector policies, protecting the most vulnerable groups Debate that led to passage of Air Pollution Control Bill Information base as government strengthened governance of regional environmental authorities and the link between national and local priorities.</td>
<td>Lao PDR adoption in 2005 of the “National Policy on Environmental and Social Sustainability for the Hydropower Sector.” Improved resettlement and consultation practices. Creation of the Watershed Management and Protection Authority for NT2. Integrated river basin planning Guidelines for environmental and social analysis Understanding of riparian risks of international rivers system of the Mekong Compliance with WB and ADB safeguard policies</td>
</tr>
<tr>
<td>Environmental priorities</td>
<td>In provincial workshops stakeholders selected SESA priorities by ranking a list of environmental and social issues identified through case studies of mining subsectors and interviews to key informants. National priorities are the provincial priorities that happened to be selected in the four provinces of Sierra Leone.</td>
<td>Government considered environmental quality crucial for strengthening the sector’s competitive advantages. Customer perception surveys showed that environmental quality, after security, was a key determinant in the selection of destinations by tourists.</td>
<td>National environmental priorities evaluated using economic analysis to assess cost of current environmental degradation and through a representative national opinion poll survey. Multiple focus groups and stakeholder workshops were used to validate findings continuously.</td>
<td>CIA evaluated potential transboundary and national significant environmental impacts of three hydropower plants (NT1, NT2 &amp; NT3) in the Mekong river system and the Tonle Sap river system in Cambodia Strategic issues for the SIA were identified by reviewing literature and finding recurrent themes in field site-visits.</td>
</tr>
</tbody>
</table>
### Scenarios of tourism expansion

Scenarios of tourism expansion were assessed against social and environmental impacts associated with those scenarios.

### Capacity gap and institutional assessment

| SESA | Scenarios of tourism expansion were assessed against social and environmental impacts associated with those scenarios | CEA focused on capacity and institutional gaps within different levels of government as well as the sector’s legal and institutional framework and drew lessons from selective case studies. The assessment was complemented by the analysis of civil society organizations to account for the demand side of environmental governance. | SIA updated the evaluation of the sector’s legal and institutional framework and drew lessons from selective case studies. Response capacity to strategic issues and significant impacts was assessed by reviewing published plans and consultation with stakeholders and donor organizations. |

- **Capacity gap and institutional assessment**
  - SESA drew lessons from a gap study focused on capacity and inter-institutional coordination within different levels of government and between the government and traditional authorities. Formal and customary rules to access to natural resources were also assessed paying special attention to the situation of poor and vulnerable stakeholders.
  - CEA focused on capacity and institutional gaps within different levels of government as well as the sector’s legal and institutional framework and drew lessons from selective case studies.

### Discussion Forum / Policy Dialogue

| SESA | For the SEA, a high level mechanism for inter-institutional coordination was established. Later this mechanism has been institutionalized as the inter-sectoral Commission for Tourism. | CEA engaged multiple stakeholders including the planning, environment and several sectoral ministries. A broader set of stakeholders were also consulted including regional authorities, the Congress, NGOs, academics, and private sector. Many of the CEA findings also were published in the media. | SIA engaged government, stakeholders and donors in discussion on institutional and capacity needs for long-term sector growth. CIA engaged stakeholders in discussions on regional impacts and development issues at different spatial and temporal scales. |

- **Discussion Forum / Policy Dialogue**
  - SESA engaged a very diverse stakeholder group comprising women and youth to discuss environmental and social issues in the context of the mining reform. A government inter-sectoral committee to steer the SESA process was also established.
  - CEA engaged multiple stakeholders including the planning, environment and several sectoral ministries. A broader set of stakeholders were also consulted including regional authorities, the Congress, NGOs, academics, and private sector. Many of the CEA findings also were published in the media.

### Political Economy Analysis

| Not used | Case studies on specific priority issues and institutional assessment included political economy analysis. A historical analysis provided insight into the political economy associated with current institutional set-ups. | Not used |

- **Political Economy Analysis**
  - The risk of SESA’s recommendations being reverted or distorted, if adopted, were analyzed in the context of governance weaknesses and power asymmetries among stakeholders.
References and Resources on Strategic Environmental Assessment


This guidance note is part of World Bank Group publication: Getting to Green—A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
Life Cycle Assessment*

Introduction

Life cycle analysis or assessment (LCA) is an examination of a product’s total environmental impacts from raw materials extraction on through to waste management. The idea of comprehensive environmental assessments of products was conceived in Europe and in the United States in the late 1960s and early 1970s (Hunt and Franklin 1996).

Many guidelines (for example, Consoli and others 1993) and eventually an international standard (ISO 1997; ISO 2006) were developed to harmonize methods. The standard is not specific enough to make the method objective, but it narrows down the methodological options somewhat and includes specific requirements on the reporting of the study. “Life cycle analysis” is sometimes used to denote a life cycle study that does not adhere to the international standard for life cycle assessment. In this Guidance Note, “life cycle assessment” and “life cycle analysis” are used interchangeably, although the term life cycle assessment is preferred.

The broad scope of LCA can help decision makers avoid sub-optimization, which is the optimization or improvement in part of a system that negatively affects other parts of the system. An LCA’s broad scope reduces the risk that a decision aiming at reducing pollution simply shifts the environmental problem from one place to another or from one environmental issue to another. The life-cycle concept also helps shift the focus of pollution management from dealing with pollutants after they have formed (called “end-of-pipe solutions”), to preventing pollutants from being formed, so that environmental impacts can be avoided or mitigated at a lower cost through product development and purchasing decisions (Allen and others 2002).
Description and Application of Life Cycle Assessment

LCA is defined as the compilation and evaluation of the inputs and outputs, and of the potential environmental impacts, of a product system throughout its life cycle (ISO 2006). The product system consists of models of the technological activities used for the product’s various stages: from extraction of the product’s raw materials, and for ancillary materials and equipment; through the item’s production and use; to the product’s disposal and the disposal of any ancillary materials and equipment. In this context, the term “product” is broadly defined to include not only physical products but also services. The service of waste management is, for example, a common object of study in LCAs.

The LCA procedure includes four phases (ISO 2006). They are briefly described here, using an LCA of

<table>
<thead>
<tr>
<th>Explanation of Key Terms</th>
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<tbody>
<tr>
<td><strong>Cleaner Production</strong>: technology and other solutions that reduce the formation of pollutants and waste through, for example, improved energy efficiency and material efficiency (compare with end-of-pipe solutions, below).</td>
</tr>
<tr>
<td><strong>Cradle to cradle</strong>: a concept that emphasizes recycling. It can be regarded as a reaction to the cradle-to-grave concept, which can imply that the materials in the product are used only once (see below).</td>
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<tr>
<td><strong>Cradle to gate</strong>: the first part of the life cycle of a product, from raw materials extraction to production of the product.</td>
</tr>
<tr>
<td><strong>Cradle to grave</strong>: the life cycle of a product, from raw materials extraction on through to waste management. Waste management can, but does not necessarily, include recycling processes (compare with cradle to cradle, above).</td>
</tr>
<tr>
<td><strong>Economic input-output table</strong>: a matrix representing a nation’s (or a region’s) economy. Each column and each row represents a sector in the economy. Each element in the matrix states, in economic terms, how much one sector buys from another sector in order to produce a unit of output. Hence, the table shows how the output of one sector in the economy is an input to other sectors.</td>
</tr>
<tr>
<td><strong>End-of-pipe solutions</strong>: technology and other solutions to deal with pollutants that have formed. Common examples are cleaning of exhaust gas and treatment of waste.</td>
</tr>
<tr>
<td><strong>Integrated Product Policy</strong>: a framework for policy making that aims at minimizing the negative environmental impacts of products by looking at all phases of the products’ life cycle and taking action where it is most effective.</td>
</tr>
<tr>
<td><strong>Life cycle analysis/assessment (LCA)</strong>: an assessment of a product’s total environmental impacts from raw materials extraction on through to waste management.</td>
</tr>
<tr>
<td><strong>Life cycle impact assessment (LCIA)</strong>: the part of an LCA where the potential environmental effects of the emissions and other effects of production are estimated.</td>
</tr>
<tr>
<td><strong>Life cycle inventory analysis (LCI)</strong>: the part of an LCA where the emissions of pollutants, the quantities of waste, and the resources consumed are calculated</td>
</tr>
<tr>
<td><strong>Sub-optimization</strong>: optimization or improvements in part of a system that negatively affects other parts of the system.</td>
</tr>
<tr>
<td><strong>Systems analysis</strong>: studies of systems, that is, sets of interacting entities. The systems investigated are typically large-scale socio-technical systems, involving components such as technological processes, the human beings managing these processes, and economic transactions. This makes systems analysis an interdisciplinary science.</td>
</tr>
<tr>
<td><strong>Well to wheel</strong>: the life cycle of an energy carrier used for propelling vehicles.</td>
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</table>
waste management as an illustrative example:

1) **Goal and scope definition (G&SD)** describes the study and its major system boundaries, methodological choices, assumptions, and data requirements. The LCA of waste management often starts with the sorting and collection of waste. In addition, it typically includes the energy systems affected by energy recovery from the waste, and the production of materials that is affected by the output of recycled material from the waste-management system (Ekvall 1999).

2) **Life cycle inventory analysis (LCI)** is the calculation of environmental inputs and outputs. Environmental inputs are the natural resources required in the life cycle. The outputs are the quantities of CO$_2$ and other pollutants and waste that are released back to nature. The LCI requires that data on material flows, resource use, emissions, and waste are collected for all processes and transports in the system defined in the G&SD. It is typically better to use software specifically designed for LCA; there is even software specialized for LCAs of waste management.

3) **Life cycle impact assessment (LCIA)** is the estimation and calculation of potential impacts on the environment. The output from the LCI model is used as a basis for these calculations. The contribution of emissions of fossil CO$_2$ and other greenhouse gases to climate change is calculated using their global warming potential (GWP).

4) **Life cycle interpretation** is the combination and evaluation of the LCI and LCIA results. This involves understanding the accuracy of the results, and ensuring that they meet the goal of the study. This is accomplished by evaluating the sensitivity of significant data elements, assessing the completeness and consistency of the study, and drawing conclusions and recommendations based on an understanding of how the LCA was conducted and the results were developed (Skone 2000).

An LCA provides information on the environmental performance of products, technological processes, and systems. Results from an LCA can be used by decision makers at all levels: from a government or the board of a multinational organization or company, to a product developer, a professional purchaser, or even a machine operator in a manufacturing plant (ISO 2006; Löfgren 2009). Policy makers can use LCA results as part of the basis for the following actions:

- decisions on legislative and economic policy instruments, such as requirements, bans, environmental taxes and fees;
- strategic planning of infrastructure;
- selection of indicators and requirements for eco-labeling schemes; and
- procurement decisions.

Industry can use LCA in product and process development, but also for strategic planning, for selection of the indicators used in monitoring environmental performance, when selecting suppliers, and in marketing (for example, through eco-labels). An LCA can also be made at various levels of complexity. A team of experts might be needed to perform an advanced LCA (Denmark, Ministry of Environment and Energy 1998), but there
are also simplified LCA tools. Such tools can contain complex models, but the interface is simple to allow quick LCAs to be made. They also sometimes result in a single score for the total environmental impact of the investigated option. A drawback of simplified LCA tools is typically a lack of transparency: more of the basic data, calculations, and assumptions are hidden and hence impossible to check, review, and understand.

Since an LCA is an assessment of a complex socio-technical system, it does not describe an objective truth but a perspective on this system. This is particularly true when results for different environmental impacts are aggregated into a single index. When a simplified LCA tool is used, the perspective is partly or fully fixed and selected when the tool is developed. This makes the results more robust in the sense that they are less dependent on who is doing the study. On the other hand, it is then important that the tool be consistent with the perspective and environmental priorities of the target audience.

The level of complexity required for a particular LCA depends on how the LCA results are to be used. A simplified tool that provides a single score for the total environmental impact makes it possible for industrial employees without environmental education to use LCA results for decision making. This is adequate if the LCA results are only used within the company and the simplified LCA tool is consistent with the perspectives and environmental priorities of the company.

A simplified LCA tool with separate results for the different environmental impacts provides more information. Using such a tool can be a good solution for employees with sufficient environmental education to understand the results, if the LCA tool is consistent with the perspectives and environmental priorities of the company. However, the lack of transparency reduces the knowledge that can be gained about such factors as the system investigated and the uncertainties involved. The lack of flexibility reduces the scope of questions that can be answered with the tool. For example, a purchaser can only rarely use a simplified LCA tool to choose between different suppliers.

Policy making is more complex than decision making in an industrial company since it typically affects many stakeholders with different perspectives. CALCAS (2008b) calls for reflexive governance in environmental policy making. This means that the main role of government is to provide a framework for debate and other participatory processes. In this context, the lack of flexibility of simplified LCA tools is a problem because they cannot account for the multiple perspectives of different stakeholders. If transparency is poor, the LCA does not provide a good basis for debate.

Ideally, policy makers and other stakeholders should be involved in discussing and selecting the study’s focus, the system boundaries, and related features. This can make the LCA an integrated part of a learning and consensus-building process. In cases where active involvement by a full range of stakeholders in the LCA is not possible, the LCA should be performed by LCA experts and
transparency reported. The results from such an LCA should not be taken at face value, but instead be used as a basis for informed debate. Used in this way, LCA can be an important tool for pollution management.

Prerequisite Factors for Life Cycle Assessment

An LCA for policy making requires:

- LCA expertise. This typically requires a background in engineering, natural sciences, or economics, and practical experience from conducting LCAs; basic understanding of LCA can be acquired through one of several textbooks on the topic; LCA practitioners worldwide also assist one other through international discussion lists.

- Generic LCA software. Several software packages are commercially available (see http://lca.jrc.ec.europa.eu/lcainfohub/toolList.vm); SimaPro and GaBi are among those most widely used.

- Access to at least one database with reliable information on emissions, waste quantities, and the use of energy and materials in a large number of production processes, transportation modes, and waste-management processes. A substantial database is often included in the commercial software; other databases are published or being developed around the world (Curran 2006; Finnveden and others 2009); additional data can be found through, for example, international discussion lists.

- Time ranging from 100 to 5,000 person-hours during the course of 3–24 calendar months, depending on the required scope and detail of the study.

Authorities could assist in this process by establishing national EPD programs, with the responsibility to develop detailed rules for the calculation of life-cycle emissions of GHG and other pollutants (IEC Web site). Authorities can also enhance national use of LCA through initiating and funding education and training programs on LCA. For example, the LCA Initiative of UNEP/SETAC (2005) is currently working to alleviate this problem by building LCA capacity in developing countries.

Advantages and Limitations of Life Cycle Assessment

The most apparent advantage of LCA is its broad scope. LCA takes into account a broad systems perspective and many different types of environmental impacts, and there are other advantages. Since LCA is a widely used tool, there is an established good practice. The expertise, software, and databases required for an effective study are easily accessible in most OECD countries. The international standard also contributes to making LCA a good tool, since it provides minimum requirements for the reporting of the study and some guidance on calculation methods.
As mentioned above, the broad scope of LCA can help decision makers avoid sub-optimization, which is the optimization or improvement in part of a system that negatively affects other parts of the system. Furthermore, LCA can assist in solving environmental problems rather than just shifting them in time and space. Policy makers can use it as part of the basis for decisions on legislative and economic policy instruments, eco-labeling schemes, strategic planning, and procurement.

An LCA can also be conducted at various levels of complexity. Generic LCA models offer the flexibility to respond to many different questions. They also allow for greater accuracy in obtaining results and for greater transparency in how they are reported. Simplified LCA models make results less dependent on the choice of LCA practitioner.

Life-cycle thinking and LCA are well established in European policy making. In developing countries, LCA is much less used because, for example, environmental measurement data are unavailable, the available LCIA methods are inadequate since they do not include soil erosion and impacts on water resources – which are major environmental issues in many non-OECD countries (Brent and others 2002), and LCA expertise is scarce. However, databases for LCA are currently being developed in many of these countries (Curran 2006). New LCIA methods are also being developed to model impacts of water use (for example, Mila i Canals and others 2009) and, possibly, soil erosion (Cowell and Clift 2000).

If transparently reported, LCA can also provide a good basis for debate on environmental issues. Such debate contributes to increasing environmental awareness among stakeholders as well as to stimulating participatory processes in policy making.

The most apparent drawbacks are that full LCAs are relatively expensive, and that the results are uncertain (Huijbregts 2001) and highly dependent on subjective methodological choices (for example, Ekvall 1999). These limitations are not unique to LCA, and they occur in most methods for environmental systems analyses, which are studies of sets of interacting entities, because of the inherent complexity of the systems. Expertise on LCA is scarce in most non-OECD countries. An LCA does not cover issues other than environmental impacts. Furthermore, LCA does not give adequate answers to several kinds of significant questions, such as the following (Ekvall and others 2007):

- finding the optimum mix of different competing options;
- selecting the best location for an investment (such as for a road or a factory);
- deciding if local environmental impacts are important; and
- deciding on the size and timing of an investment.

**Interaction with other Tools and Possible Substitutes**

The broad systems perspective of LCA makes it a good tool for advancing cleaner production, which has the aim of shifting focus from exhaust-gas cleaning and waste treatment to reducing the formation of pollutants and waste through, for
example, improved energy efficiency and efficient materials. It is also a good tool in the framework of sustainable consumption and production. Avoiding sub-optimization is a key element in these contexts.

An LCA, just like systems analysis in general, entails a drastic simplification of a complex reality. The description can be made more comprehensive and detailed by adding, for example, tools for economic analysis, dynamic linear and non-linear modeling, and site-dependent modeling of environmental impacts. Such methods can be integrated with LCA into a single assessment, or used as separate tools in parallel studies (Ekvall and others 2007).

Hybrid LCA is an LCA that uses tables (called “economic input-output tables”) to represent a nation’s (or region’s) economy. Each column and each row represent a sector in the economy. Each element in the matrix states, in economic terms, how much one sector buys from another sector in order to produce a unit of output. Hence, the table shows how the output of one sector in the economy is an input to other sectors. Economic input-output tables make the model of the life cycle more comprehensive (Finnveden and others 2009).

Strategic environmental assessment (SEA) and environmental impact assessment (EIA) are separate tools or frameworks for assessing policies and for site-dependent assessments (Finnveden and Moberg 2005). However, LCA can be included as an element in both SEA and EIS. An LCA is also well suited for the environmental assessment in a cost-benefit analysis (CBA; Denmark, Nordic Council of Ministers 2007). Many other tools can be used in parallel, or in combination, with LCA (Schepelman and others 2008). As more aspects are added to the analysis, the complexity of the study increases: more data are required, the uncertainty grows, and the study becomes less transparent.

**Practical Examples of Life Cycle Assessment and Lessons Learned**

Legislation and other policy documents in the European Union often call for life-cycle considerations, as in the following examples:

- The Integrated Product Policy (DG Environment 2000), a framework for policy making to minimize the negative environmental impacts of products by looking at all phases of the products’ life cycle and taking action where it is most effective;
- The Thematic Strategy on the Sustainable Use of natural Resources (EU 2005a);
- The Thematic Strategy on the Prevention and Recycling of Waste (EU 2005b);
- The Sustainable Consumption and Production Action Plan (EU 2008a); and

The European legislation requires quantitative life-cycle calculations to be made when reporting emissions of greenhouse gases (GHG) from biofuels and for calculation of the resultant savings in GHG emissions (EU 2009a; EU 2009b).
Authorities in many countries promote the use of Environmental Product Declarations (EPDs), which present LCA results for professional purchasers (IEC Web site). Some countries, notably France (Boeglin 2010) and Japan, will also require the labeling of consumer products with information on life cycle emissions of GHG and other pollutants.

Results from LCAs have also been used as basis for debate and decisions in the policy-making process. Quantitative LCAs were systematically carried out on many different categories of energy-using products in the development of European eco-design requirements for such products (EU 2005c; VHK 2005). These LCAs where carried through using a simplified LCA tool, which served to make the many LCAs cheaper and more consistent. On the other hand, the use of a simplified tool reduced the accuracy and transparency of the studies. Stakeholder involvement was ensured at data collection and through workshops where the results of the studies were presented.

Many LCAs have been published on energy carriers (such as electricity, fuel, and heat); products from process industry (bulk materials such as paper, steel, and plastics); manufactured products (like cars and cell phones); and food. Fewer LCAs have been carried through in the service sector. Most LCAs do not have an explicit policy-decision context, but they can still be relevant for policy makers.

In non-OECD countries, there is a clear interest in using LCA for waste-management planning (for example, Miliūtė and Staniškis 2010; Stenmarck 2009). A growing number of policy-relevant LCAs are also carried at, often at universities, sometimes in cooperation with researchers from OECD countries. Mungkung and others (2006) used an LCA on Thai shrimp production to demonstrate that LCA can provide a basis for eco-labeling programs.

Besides policy making, LCA is likely to become a more important tool in the industries of all countries. Many manufacturers will even be required to calculate and present the life-cycle emissions of their products in order to reach markets in France and Japan.

References and Resources on Life Cycle Assessment


http://www.calcasproject.net/


http://www.iscp.org.cn/clcm2008en/


http://www.springerlink.com/content/4638534w14515t43/fulltext.pdf


http://www2.mst.dk/Udgiv/Publications/1998-87-7909-014-1/pfd/87-7909-014-1.PDF


Copenhagen. 


Journal of Cleaner Production 7 (4): 281–94.


Selected Additional Resources

Publications


Databases


National Risk Management Research Laboratory's Life-Cycle Assessment web site. Available at: http://www.epa.gov/NRMRL/lcaaccess/.

PROBAS database. Umweltbundesamt (German Environmental Protection Agency). Available at: http://www.probas.umweltbundesamt.de/php/index.php (in German).

SPINE®CPM database. Competence Center in Environmental Assessment of Product and Material Systems (CPM), Chalmers University of Technology, Göteborg, Sweden. Available at: http://www.cpm.chalmers.se/CPMDatabas e/


Scientific journals

Journal of Cleaner Production, Available at: http://www.elsevier.com/wps/find/journaldescription.cws_home/30440/description#description


The International Journal of Life Cycle Assessment. Available at: http://www.springerlink.com/content/112849/
Discussion lists

The PRé LCA list: join at http://lists.lyris.net/cgi-bin/lyris.pl?enter=lca

Links to other links

US EPA. Risk Management Sustainable Technology. LCA Resources: http://www.epa.gov/nrmrl/std/lca/resources.html
Targeting Legacy Pollution*

Introduction

Legacy pollution refers to any pollution that remains from past activities where there is no immediately responsible party who can be held liable for the pollution and compelled to carry out remediation. Under typical legislation, as in OECD countries, the polluter or the current owner of the facilities/land would normally be responsible and required to carry out the necessary clean-up, in line with relevant standards and requirements. However, there are several reasons why this approach may not be feasible in a given case. At some sites, liability cannot be enforced easily (as may be the case for former state-owned enterprises), or legal and technical difficulties may frustrate efforts to enforce timely remediation action. Other sites are “orphans” where the original polluters are unknown or untraceable or where the owners are (or claim to be) bankrupt. The legislation itself may not impose full liability on past activities which were legal and acceptable at the time. In such cases, the government has to initiate action to control and ensure the remediation of the pollution, although the government may have limited technical and financial resources to apply to such problems and is likely to look to opportunities to involve the private sector in the remediation where possible.

This guidance note identifies ways to address legacy pollution and the initial stages in implementing those approaches. It sets out the main steps and issues in initiating a remediation process, and does not address in detail the technical requirements for physical remediation of legacy pollution sites.

Description and Application of Targeting Legacy Pollution

Legacy pollution is often associated with abandoned buildings and facilities that are contaminated with toxic materials, dumping of hazardous waste, or the uncontrolled discharges of effluents. It is also associated with mining activities, especially where there has been a long history of mining, with many different operators. It is often evident as contamination of land but can also result in polluted

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1 The revitalization of run-down industrial areas, often known as “brownfields redevelopment”, is the key objective of remediation in some cases. A manual on these issues has just been prepared by the World Bank’s ECA region (see Ionescu-Herioiu 2010).
surface or groundwater. In some cases, such as abandoned mine tailings, the main impact may be through airborne dust and pollutants.

Legacy pollution sites are characterized by the existence of potentially harmful materials, which are known to be toxic to humans or destructive to the environment, in proximity to communities or sensitive ecosystems that are being impacted or are at significant risk from the pollution. In serious cases, where toxic substances such as heavy metals and organic chemicals are involved, there is the potential to cause severe health impacts to human populations and to result in significant and long-term damage to the environment.

The sites themselves may have potential economic or financial value because of their location and size but the costs of remediation or uncertainty about standards, liability, and costs may be preventing private sector interventions to take advantage of that potential value. In other cases, the land value of the sites may be very limited. Although the institutional context is different, many of the technical approaches developed for dealing with contaminated land are also applicable to legacy pollution.

A need for urgent action arises when the legacy pollution is known to be causing serious impacts on the health and wellbeing of local communities or where it is resulting in significant and unsustainable damage to the environment. In such cases, the government may be forced to step in and take action, even if all administrative or legal options have not been exhausted. The priority then is to deal with the immediate health or environmental damage. Given

**Box 1. From Brownfields to the Olympics**

A well-known example of successful brownfields redevelopment is the site of the 2000 Olympic Games at Homebush Bay in Sydney. Sydney's rapid expansion in the 1950s and 60s resulted in increasing quantities of waste and by the end of the 1970s, the original bay no longer existed and most low-lying land had been filled. By 1988 there was an estimated 9 million cubic meters of waste and contaminated soils spread over 400 hectares within the 760 hectare site. The waste included petroleum waste, unexploded ordnance, illegally dumped wastes along the waterways (including POPs and other organic wastes), dredged sediments, municipal waste and industrial waste (including rubble, power station fly ash, gasworks waste, and asbestos) and contamination from site activities (including burning pits and chemical leaks).

Efforts had begun nearly a decade before the Games to reclaim this area of “brickworks, slaughterhouses, salt works, landfill, and dumping grounds” on Homebush Bay. The initial aims of the remediation were to block the spread of contamination; restore the waterways; and provide for the long-term social, cultural, and sporting requirements of the people of New South Wales. However, the awarding of the Games to Sydney was used as the impetus to step up efforts and resulted in the Olympic Park, with its integrated ecological design, that has become one of Australia’s largest urban renewal projects. After the Games, the Sydney Olympic Park Authority was established with responsibility to manage the public assets created, including open space, venues, parklands, and development areas. The Authority is now working to a 2030 Master Plan, to continue to develop the area as a sporting, entertainment, and business center.

Although the Olympic Park site is seen as a major success, on-going remediation efforts at another site at Homebush Bay have been controversial, with major community concerns about the standards and technologies proposed.
the limited resources available, selecting priorities and working to realistic objectives are essential in dealing with such cases.

In other cases, particularly in locations where there had been large industrial complexes, the incentive for action may be economic regeneration of now defunct areas. In this context, the area may be too large or the challenges too complex for private sector companies to take the lead, even if some parts could be profitably redeveloped (see box 1). In such cases, the government can use this as an opportunity to develop a comprehensive approach which encourages parties to work cooperatively, both for development of individual sites and for the problems of legacy pollution as a whole.

**Risk-Based Approach.** It is rarely practical to return polluted areas to pristine conditions. For this reason, approaches based on risk and cost-effectiveness are often adopted for remediation, which balance the potential harm that a polluted area poses to the population and environment, on the one hand, with the resources required to deal with that area, on the other hand (see box 2). The assessment can be implemented at different levels of detail. In practice, a staged approach is usually used, where the initial step is generally a qualitative screening process, based on information collected from readily available sources.

This step is followed by site-specific sampling and

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**Box 2. Risk-Based Approach**

A hazard is a potentially harmful substance or situation, for example, a waste containing a high level of a toxic substance. A risk is the possibility that such a hazard will result in unacceptable impacts on humans or the environment, in a specific context. As summarized by an authoritative U.S. review at a time when approaches to environmental regulation were being broadly debated, “risk assessment is the characterization of the potential adverse health effects of human exposure to environmental hazards” (NRC 1983). That review states that risk assessment “contains some or all of the following four steps: hazard identification; dose-response assessment; exposure assessment; and risk characterization.”

This is the essence of the widely used basic model of risk assessment, which looks at a causal linkage: Source-Pathway-Receptor (SPR). In the present context, the model can be seen as Pollution-Pathway-People. Each of these elements must be present and there must be plausible links between them for a serious risk of damage to exist. Hazard identification addresses the characteristics of the pollution source. Exposure assessment is the consideration of the population (or ecosystem) threatened by this pollution and the pathway by which they are impacted. The dose-response component, which addresses how the human (or other organism) reacts to the specific toxin, is normally taken from medical or other scientific literature (for example, World Health Organization guidelines for specific substances). Risk characterization is the combination of these components into an overall conclusion, expressed either qualitatively (high, medium, or low) or as a probability.
data collection, and better definition of pathways linking pollution sources to affected populations, with specific target populations or ecological receptors identified. National standards or values from the international medical science literature are typically used to address risks to human health for different pollutants. Once the pollution-pathway-people linkages are understood, then interventions to reduce risk can be designed and options compared to find the preferred or most cost-effective actions to protect human health. These options cover: the removal of the source of pollution; in cases where removal of the pollution (and safe disposal elsewhere) is not a feasible option, then breaking the pathway by containing the waste or similar approaches may be feasible; if removal or avoidance is not practical, then relocating people may have to be considered, especially if the numbers involved are limited. In any case, involvement of the various stakeholders in this process is essential to public acceptance of the outcomes.

An important component of the risk-assessment process is to understand, as far as possible, the potential future uses for the site, recognizing that land-use planning systems may be weak in developing countries. A “general use” (that is, unrestricted) clean-up standard should not be adopted as a default without careful consideration of the cost implications. The assumptions about future uses can have a significant impact on the remediation decision-making process and need to be carefully tested. It is difficult to predict how future changes in planning regulations may allow changes in use from that assumed in the remediation process; therefore, clear assumptions should be used and careful records kept of work done and any identified remaining pollution.

The choice of remediation standards to apply to a project is critical. For a specific site, it is important to establish a small set of parameters of major relevance and to define key values for these parameters for use in the first round of investigations and remediation. Target Remediation Values relate to projected or planned future uses and are the technical objectives of the remediation. It is also useful to define a site-specific Intervention Value used to set the broad limits of the initial remediation effort. The Intervention Value (or screening value or trigger value) indicates the area within which serious contamination exists. An Action Value defines areas of higher contamination which require priority remediation actions, for example areas where waste material has been dumped. The Intervention and Action Values are used to focus efforts on the areas that are most polluted. The selection of such criteria in any given case will depend on local standards (if any exist) or on the most relevant set of reference standards (typically either North American or European).

The management of issues around legacy pollution is complex, even in developed countries. The key challenges that govern the responses are usually institutional and financial; the required physical interventions, at least in the initial stages, are often relatively simple. Addressing legacy pollution will involve the government through different departments and at different levels (national, sub-national, and local). There will also be a variety of private sector parties that need to be part of the
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process: these will include the original polluters (in whatever form or legal entity they now exist); current owners (be they government, new companies, or unknown); local communities affected by the pollution and other groups; academics; and institutions and various experts. Given the key question of finance for remediation, the relevant parties include government financial agencies, banks, and potential investors.

The problem is inherently messy, and it may be difficult to know where to start. No one size fits all, but there are a number of basic steps that are common to most legacy pollution problems. The following sections set out guidance on how to begin to address the problems.

Identification And Decision Stage. This step develops a thorough understanding of the pollution issue. Several components must be reviewed to complete this step.

1) Accept the problem and establish responsibility and leadership. Put in place the structures and personnel, with the necessary authority to make the relevant decisions. This will have resource implications and needs planning ahead to ensure that adequate budgetary provisions are made.

2) Carry out initial assessment. A clear, structured, and quantified assessment of the site(s) needs to be prepared at an early stage.

3) Identify stakeholders. A key requirement is that stakeholders who participate are committed to finding solutions. The communities that are directly affected need to be included, particularly where there are health concerns that have to be addressed. In addition, respected independent specialists who have knowledge of the issues may be able to make important contributions to the stakeholder process. Representatives of the polluting enterprises should be involved (often through industry associations) as well as developers, potential financiers, and relevant technical specialists. These parties will often have both site-specific and more general expertise to contribute and are likely to be a significant part of any major redevelopment effort. The interest of private developers in the site in question is often constrained by uncertainty and by real or perceived risks – the stakeholder process should address these constraints in order to unlock the potential value of the site.

4) Agree on objectives, accepting uncertainty and risk. There will often be a wide range of perceptions of problems, risks, and solutions. It is important at the early stage to reach agreement on immediate objectives – in the context of possible future land uses – and on the process to be used in achieving those objectives.

Preparation stage. After the groundwork is completed in the identification and decision stages, the project team may move on to the preparation stage, which organizes the group dynamics. The four steps in this stage are outlined below.

1) Appoint project manager and establish stakeholder group. The stakeholder group may be a formal
structure, such as a committee established by the authorities, or it may be an ad hoc group.

2) **Set priorities.** The project manager, working with the stakeholder group, must begin by establishing the priorities, based on a review of the site risk assessment and of the relevant standards and target values.

3) **Assess technical aspects and options.** Key parameters governing selection of plausible options are the size, location, and other physical characteristics of the site. A range of technologies is well established in industrialized countries, but the necessary technical and the financial resources may be lacking to apply them in less developed cases, and the approaches may have to be adjusted or modified.

4) **Legal and regulatory clearances.** Remediation activities, even if undertaken for good health and environmental reasons, still need to satisfy, or to be formally exempted from, the necessary legal and regulatory requirements.

**Technical options.** Selection of technology for dealing with the pollution depends on a range of factors, some of which are specific to the circumstances of a particular case. Relevant technical expertise will be required to support identification of technical options, but extensive studies are not always necessary in order to take initial action to deal with urgent problems. As well as the basic physical parameters, five important factors are listed below that need to be taken into account in identifying feasible technical options.

1) **Potential value and uses of the site.** These will control the remediation standards selected. A site that has limited potential future use may allow options such as containment and/or long term disposal on-site to be considered, with the appropriate institutional controls.

2) **Biodegradability of the key pollutants.** Biodegradable pollutants may be amenable to in-situ treatment where the remediation is not driven by urgent risks.

3) **Extent of off-site transport of pollution.** Where major pathways are off-site, such as surface or groundwater flows, or wind-blown dust, immediate action may be focused on dealing with the pathway.

4) **Groundwater as a critical pathway.** Where the critical pathway is groundwater, action to remove the source or to isolate it from the groundwater becomes crucial.

5) **Availability of secure disposal facilities.** Removal from the site of highly contaminated material will often be constrained by the availability and cost of approved secure disposal facilities and the practicalities of transporting contaminated material.

The following table sets out some basic practical approaches that are likely to be appropriate for initial remediation options (for more details see CLU-IN Web site). More sophisticated approaches than those outlined here may be relevant but would need to be justified in terms of cost-effectiveness. Use of novel or untested technologies can only rarely be appropriate.

It should be noted that remediation design is very much an iterative process of establishing desired
outcomes, considering technical options, examining costs and benefits – and then reviewing and revising the outcomes and options. For a complex site, where a number of approaches may be needed for different parts of the site, the design process in effect continues throughout the whole remediation, with the results of early interventions feeding back into subsequent stages (see table 1).

Table 1. Some Practical Approaches to Dealing with Sources

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>APPLICATIONS AND CHALLENGES</th>
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<tbody>
<tr>
<td>Isolation of pollution source</td>
<td>Restriction of access may be an important initial step, which can be applied quickly, but does not allow the potential value of the site to be developed.</td>
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<tr>
<td>Containment</td>
<td>Simple containment of the source may be effective if the pollution is in a small area. Capping and sealing a waste dump can reduce the amount of material transported by wind and surface water. If the impacts are on groundwater, capping the surface material may have only limited benefits. As with isolation, containment is typically a short term solution and does not allow the potential value of the site to be realized.</td>
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<tr>
<td>Excavation and disposal</td>
<td>Excavation of the contaminated material and its safe disposal elsewhere removes the pollution source, but the cost can be high. Finding an approved off-site disposal solution can be a major constraint and this needs to be addressed at the earliest stages. It may be more practical and cost-effective to utilize a part of the contaminated site for secure disposal. However, this must be done in a technically sound manner.</td>
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<tr>
<td>Physical or chemical treatment, in-situ or ex-situ</td>
<td>There are a number of techniques that involve in-situ physical, chemical, or thermal treatment of contaminated soil. Some in-situ treatments can be relatively straightforward, such as treatment with simple chemicals to immobilize the contaminant, but others are relatively complicated and expensive. In other cases, ex-situ treatment (i.e. excavation, treatment (and replacement)) may be justified. These approaches are best applied to well-defined problems where the approach can be tailored to the circumstances.</td>
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<td>Soil vapor extraction</td>
<td>Soil vapor extraction applies suction (via wells) to the soil zone above the groundwater table. This approach, which is often targeted at volatile organic compounds (VOCs) in the soil, draws the volatiles to the surface where they can be destroyed or vented via surface systems. The system functions best on relatively permeable soils.</td>
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<tr>
<td>Bioremediation</td>
<td>Various forms of in-situ bioremediation may be relevant to reduce contaminant levels, particularly where the areas/quantities are large. The approach is typically used where the contaminants are organic. The most effective treatment materials can be expensive and difficult to obtain. However, simpler additives may be cost-effective where application costs are low and where time can be allowed for repeated applications. Ex-situ versions of bio-remediation are also possible but are likely to be more costly.</td>
</tr>
<tr>
<td>Phytoremediation</td>
<td>In this approach, contaminated lands are planted with specific species that selectively or very efficiently take up the contaminants. This approach is often suitable for areas contaminated with heavy metals. The uptake of the contaminants is often slow and many seasons are required, but if local species can be used, then the costs are relatively low.</td>
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<tr>
<td>Groundwater treatment</td>
<td>Once groundwater has been polluted, it is normally very difficult to treat. Groundwater can be remediated through pump and treat approaches, which re-inject the water, but these are usually too costly for most developing country applications. In some circumstances, treatment of a specific concentrated pollutant plume by injection of chemicals may reduce the overall impacts, but these approaches are be costly and of limited application.</td>
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Financing. It is possible to outline a series of different financing options, taking into account the extent to which the private sector can be convinced to undertake some or all of the clean-up in reasonable anticipation of financial or reputational returns. The fundamental approach is based on the government using various mechanisms to reduce the amount of
public funding that has to be provided. In the best case, the government will compel or persuade the polluter to undertake the remediation. However, if the original polluter is unwilling or unable, the government will look to using planning, regulatory or financial incentives as a way to bring other potential partners into the process by creating potential value in the site, once remediated. Where it is not possible to create adequate incentives, the government will have to take action to deal with urgent problems. In such cases, the government will be careful about maximizing the value of its investment and will also look to recover any of its costs, after the fact, if possible. Options for financing physical works can be broadly outlined as shown in table 2.

The basic issue is that the estimated costs of remediation are greater than the financial returns, although not necessarily greater than the economic benefits. For a government-led remediation project, one important objective is to ensure that all funds are used in an effective, transparent, accountable manner, according to core technical and environmental requirements and with clear concepts in mind to recover as much as possible of any public funds provided. The government is therefore always seeking ways to reduce the costs, to obtain some of the funding from other sources, and to ensure that it can benefit from any increase in land values from the remediation.

Institutes may be able to provide support for surveys and analysis under research or technical training programs. In some cases, industry associations that are supportive of the remediation have accepted contaminated material in private treatment or disposal facilities or provided space in disposal facilities at reduced costs. Other government departments may be able to support ancillary works - such as access roads or connection of services - through unrelated infrastructure funds. Creative identification of such possible contributions is an important role for the remediation team.

There are usually significant uncertainties and risks that constrain potential private sector initiatives to recover value from the site. A major role for government, through the stakeholder process, is to understand the factors that prevent the private sector from playing a bigger role. Understanding and clarifying these factors can reduce the financing gap and can encourage the private sector to become involved in finding solutions.

It is unlikely that one source of funding will cover all the remediation work. In practice, the remediation is often comprised of different actions and it may be possible to obtain in-kind or cash contributions from different parties. Local scientific or technical
<table>
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<th>OPTION</th>
<th>CHARACTERISTICS</th>
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<tr>
<td><strong>Public-Led Collective Approach</strong></td>
<td>This will involve discussions with relevant parties – without necessarily admission of liability by any of those associated with the source of pollution – in order to find practical options. Collaborative clean-up approaches would typically include actions by the private sector, encouraged by financial incentives such as tax breaks or planning exemptions; by local governments, such as provision of infrastructure (for example, disposal sites); with inputs from community or non-governmental groups. The test for government support for actions under this approach is whether they can achieve public benefits in a cost-effective manner.</td>
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<tr>
<td>Government provides financial and planning incentives and may provide some relevant infrastructure such as roads.</td>
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<tr>
<td>Polluter (or subsequent owner) carries out remediation (perhaps without admission of liability).</td>
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| Brownfields Redevelopment with Public Sector Support | This form of collective solution may apply particularly in the case where the original site or source of pollution was a large industrial facility belonging to a government entity that no longer exists. In such cases, a process of redevelopment that generates enough revenue to cover the remediation costs may be a good solution for all parties. Where development land is in demand, typically in urban fringes where old industrial areas are being transformed into commercial and residential uses, it may be possible to recover the costs of the remediation. |
| Private sector, typically developer, invests in remediation of site in order to create higher value land. | |
| Government (especially if the nominal owner of the site) supports remediation by negotiating planning and other conditions. | |
| Process must be carried out in a transparent and public way because of the potential for misuse of discretion. | |

| Public Funding with Cost Recovery | Where the need for intervention is urgent, and administrative and legal actions are not being effective, the government may undertake the most urgent remediation works using its own funds and recover the costs (with administrative overheads) from the responsible party. |
| Government establishes administrative structure and provides adequate funding to cover most urgent remediation expenditures. | |
| Costs recovered through legal action, including taking ownership of (or a lien on) the land, as payment for the costs of remediation. | |

| Public Funding of Priority Interventions | In cases where there is no prospect of recovering any of the costs from the polluter or a successor body, the government may be forced to take action because of the seriousness of a particular case. Governments should establish the necessary legislative and administrative framework to undertake such projects, in order to ensure that the necessary interventions are identified and carried out as effectively as possible. |
| Government directly funds the priority interventions required to protect health and environment. | |
| Public consultation and community involvement required because of need to set priorities, in context of other government funding demands. | |

In such cases, given the competing demands on public funds, a careful cost-effectiveness analysis must be carried out to determine the sequence and timing of priority actions, with the objective of initially removing the most immediate threats to health and environment.
In some cases the government can unlock synergies by tying the remediation efforts to starting the redevelopment of a “contaminated” district or by establishing a new transport corridor, which could both utilize and open up an affected area. Very often a relatively limited government investment of seed money can be an effective intervention. It is often the perceived risks as much as the real situation that constitutes the investment obstacle, thus public funds for initial investigations and risk assessments at various levels of detail can be very effective. These essential early studies make previously uncertain liabilities much better understood and financially quantifiable, which can immediately increase the value of a site significantly, because investor confidence is bolstered.

**Remediation Funds.** It is an increasingly common practice in industrialized economies to put in place some system of provisions, liability, or levy to ensure that individual companies are held responsible for the final closure and clean-up of facilities, and that they cannot avoid their responsibilities by winding up the operating company or through similar legal maneuvers. A wide range of possible systems exists, and their review is beyond the scope of this guidance note. However, while state funds created for addressing pollution legacies can be effective, they may also be subject to inefficiency and outright corruption. Careful design and clear accountability are needed to ensure that the added value created by centralized expertise and experience is not lost due to shortcomings in financial control.

**Prerequisite Factors for Targeting Legacy Pollution**

The technical requirements for dealing with legacy pollution are not significantly different from those normally available in an established environmental agency and related technical institutes. The specific skills required to staff a remediation unit include: toxicology/public health; risk assessment; engineering and project management; and public consultation processes. This group would need to be able to draw on specialist input as required, including surveying, sampling and testing, and groundwater studies. The equipment requirements are relatively basic and again similar to those required for a good environmental office, and include computers, a GIS system, and transport. This technical team would require some support and capacity building in the initial phases of the work, but this should not entail significant time or resources.

**Advantages and Limitations of Targeting Legacy Pollution**

Targeting legacy pollution may open land to future development opportunities and increase the value of neighboring property. Additionally, the mitigation of an old pollution source may increase the health of local populations.

There are unfortunately many examples of broad pollution that cannot be easily attributed to specific sources - examples include degraded air quality in urban areas and river systems that have been
contaminated by a wide range of direct and indirect discharges. The approaches summarized in this note can be part of a response to such challenges but are not adequate, on their own, to address these broad problems.

**Interaction with Other Tools and Possible Substitutes**

Resources for remediation of legacy pollution are always limited; consequently, decisions have to be made about priorities and the extent of interventions. The classic economic approach to evaluating investment decisions is a cost-benefit analysis (CBA). However, estimating the benefits of health and environmental improvements is complex and often contentious. The simpler and more easily understood approach is cost-effectiveness analysis (CEA), which is based on the cost of achieving specific risk-reduction levels.

Such a cost-effectiveness approach can guide the choice of options so that the greatest level of improvement is achieved with the resources available. The basis is the reduction of identified risks in order to protect local communities from the immediate impacts of pollution (or a similar high-level environmental objective). A goal of achieving specific low pollutant concentrations in the environment may be the long-term objective but is not always appropriate for designing short-term interventions when resources are limited.

**Preventing recurrence.** Removing legacy pollution is often only one aspect of a broader health and pollution management program. Other sources of pollution in the same location must also be controlled, and measures must be put in place to prevent recurrence of the dumping or illegal disposal that caused the initial problems. In particular, the source of the toxic or hazardous wastes must be identified and regulated, and practical alternatives to dumping must be established. In many cases, this is likely to involve support for establishing affordable hazardous waste management facilities and for encouraging waste reduction and recycling measures.

**Practical Examples of Targeting Legacy Pollution and Lessons Learned**

Hazardous and legacy waste problems are usually relatively localized – if severe – in their impacts. Consequently, the primary responsibility tends to be with local governments, which are usually not well equipped to deal with these problems. It is important for national governments to take a proactive approach to identifying and dealing with legacy pollution, usually as a part of a national management program that will identify priority legacy sites and will put in place mechanisms to guide and support the implementation of remediation at the individual sites.
Any national effort must start with the appropriate environmental agency being given the mandate and powers to develop and then implement a comprehensive program. The first main element will be to develop a list of priority sites or “hotspots”, as well as making an inventory of the facilities and resources available to deal with these pollution sources. The national government then needs to address the provision of technical and financial resources to allow the top priority sites to be cleaned up within a realistic time frame and for the necessary long-term measures to be put in place (see box 3).

**Box 3. Examples of Countries with National Programs**

*China* – which is particularly concerned about the extent of contamination of productive farmland, often from legacy pollution, and which is in the process of identifying priority areas and remediation options.

*Germany* – where, through the Treuhand Agency, the government has taken responsibility for many industrial plants, a number of which had serious environmental legacy problems. The processes of sharing liability for these sites and the subsequent efforts to deal with the pollution still continue in some areas.

*India* – which is preparing a National Remediation Program, under which the most urgent sites (including legacy sites) have been inventoried and priorities are being set for interventions.

*Mexico* – where an inventory of contaminated sites has been prepared and a number of interventions are being developed.

*United States* – which has the Superfund Program that addresses abandoned, accidentally spilled, and illegally dumped hazardous wastes that pose current or future threats to human health or the environment. A basic element of Superfund was provision to allow the government to proceed with urgent remediation work at its expense and to recover costs from liable parties. The Superfund has resulted in the clean-up of nearly a thousand sites over twenty-five years and has established an extensive body of technical and operational experience, particularly in relation to risk-assessment methodologies and treatment technologies. A number of significant Superfund site clean-ups have been well documented and provide insights and lessons for specific types of problems (for example, NRC 2005), although these insights and lessons can only be transferred to developing countries with full regard for local conditions and constraints.

*European Union* – under EU directives, all the countries of the European Union are implementing programs in different ways to deal with toxic pollution and soil protection. The variety of such efforts demonstrates that there is no one best way to deal with the issues.

**References and Resources on Targeting Legacy Pollution**


This guidance note is part of World Bank Group publication: Getting to Green—A Sourcebook of Pollution Management

Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
Land Use Planning

Introduction

Land use planning is an essential tool for pollution prevention and control. Land uses are categories that refer to the different socioeconomic activities occurring in a particular area, the human behavior patterns they create, and their effects on the environment. While these activities take place at the local level, they can also contribute to global processes, such as climate change. Therefore, by appropriately defining land uses, establishing where and how they occur, as well as effectively controlling their performance and interrelation, governments can actively participate in preventing and controlling pollution.

Description and Application of Land Use Planning

Land use planning refers to the process by which a society, through its institutions, decides where, within its territory, different socioeconomic activities such as agriculture, housing, industry, recreation, and commerce should take place. This includes protecting well-defined areas from development due to environmental, cultural, historical, or similar reasons, and establishing provisions that control the nature of development activities. These controls determine features such as plot areas, their land consumption or surface ratio, their intensity or floor-area ratio, their density or units of that activity (or people) per hectare, the technical standards of the infrastructure and buildings that will serve them, and related parking allowances. In relation to pollution prevention, land use provisions should include, where applicable, levels of gas emissions, light radiation, noise, water, solid waste discharges, and on-site or pre-disposal treatment of pollutants. All of these provisions should be included in the jurisdiction’s land use or zoning code. A good system of protected areas, together with strong land use provisions, should result in a less-polluted jurisdiction.

Planning process. In open societies, the land use plan and zoning code are prepared by planning institutions (Mandelker and others 1990). The plan and code are subject to the processes of public consultation and participation defined by the jurisdiction’s laws. The plan and code are approved by the jurisdiction’s legislative branch, sanctioned by the jurisdiction’s chief executive (such as a governor...
or mayor), and are subject to the constitutional tests and rulings of the judiciary. The plan is implemented through the permit-issuing process for land subdivision (or development) and the construction-permit process. Through these processes, landowners yield a portion of their properties and pay development fees that, together with land and real estate taxes, constitute the main source of funding for construction and maintenance of public works and public spaces, as well as for services by the jurisdiction. Ten good practices in land use planning that can help attain positive environmental effects are described below.

1) Define, make, and effectively protect “no-go” areas in recognition of their high environmental, historical, or cultural values, for their biodiversity, or because they can help contain unnecessary and costly urban expansion. Protection of “no-go” areas should be combined with measures that allow transfer of development rights from these areas into ones where development is acceptable. Furthermore, protection of “no-go” areas should be supported by fiscal measures that preserve lands in their natural condition or preserve the profitability of rural economic activities. Such environmental protections will increase the likelihood of new settlers establishing themselves in developed areas that will likely have pollution-control measures and other environmental protection mechanisms in place.

2) Plan for industrial zones, by appropriately defining their location, design, infrastructure, regulation, and the buffers separating them from residential and other activity zones. This should be combined with fiscal and other incentives for remediation and resettlement on contaminated sites. In addition, pollution-control mechanisms that exceed standards should be applied.

3) Establish, within urbanized areas, land uses, densities, and intensity of development that result in increased usage of public transit, decreased usage of private vehicles, and reduced consumption of energy at the household level. This will diminish emissions, levels of air pollution, and energy use, and increase the effectiveness of existing pollution-control mechanisms and practices.

4) Integrate the urban and rural realms into the same framework for land-use planning. This allows an integrated approach to the conceptualization and management of growth and land use, as opposed to a competitive approach in which urbanization is carried out at the expense of rural settings.

5) Carefully establish and modify urban-rural boundaries, closely linking them to available capacity for providing water and wastewater treatment, and to the area’s economic linkages and commuting patterns. This helps increase the overall density in urbanized areas, maximize the use of installed infrastructure and transit corridors, and reduce the costly extension of infrastructure further into rural areas.

6) Define boundaries so they are perceived as territories, like greenbelts. These can be of a size, character, and use that can convey the idea of an
edge marking the transition from one setting to the other, even if both are urbanized settings.

7) Develop all types of urban agriculture within greenbelts, boundary territories and inside urbanized areas. Such agriculture would include green roofs, neighborhood and community farms, or large farm operations, and implementing creative incentives to make them economically feasible.

8) Establish authorized levels of gas emissions, noise, air pollution, sun radiation, energy consumption, solid and water waste discharges, and similar measures for the different land uses and constructions that will house them. Fining or penalizing operations that exceed these requirements.

9) Require on-site or pre-disposal treatment of pollutants, and granting bonuses or incentives for additional, positive contributions to the environment.

10) Mandate the use of green building standards, techniques and materials, like the ones established by ASTM International (formerly the American Society of Testing and Materials).

The most valuable mechanism for pollution prevention within the land use planning process is the way in which a government applies the above mechanisms in an integrated manner. Several principles and objectives are now recognized as valid means for controlling pollution and reducing the ecological footprint of urbanized areas. These have been named the six C’s, and refer to the pursuit of territories that are Complete, Compact, Conserve and restore the natural resources, and to developments that are Comfortable and are produced in Coordinated, as well as in Collaborative, ways (Pivo 1996).

Prerequisite Factors for Land Use Planning

A multidisciplinary land-use planning institution must incorporate strong community relations and a complete set of instruments for negotiating land uses and developments for the benefit of the public. This institution should be comprised of environmental, physical, transportation and infrastructure, and socioeconomic development teams. Additionally, a community relations division should be in charge of general communications, of conducting public meetings, and of ensuring a participation process that takes full advantage of the tools available to society in this area. A land-management division will be entrusted with managing the planning process as well as negotiating planning policies in the context of sector area plans. A legal division will be entrusted with defining, applying, and proposing reforms of the legal instruments necessary to create levers that will change the market. Finally, a division that provides geographic information, cadastre, and land-value assessment will ensure the accessibility, consistency, and quality of the legal and socioeconomic information on the properties that make up the jurisdiction.

Additionally, a mechanism or institution must be established to ensure concerted, collaborative, and cooperative decisions in the case of municipalities comprising a metropolitan or regional area. These decisions would center on regional land uses, infrastructure, protection areas and other policies that
need to be addressed at a supra-municipal level. That mechanism would also have the responsibility and authority to ensure acceptance or adoption of those policies at the local level.

There are two instances in which land use planning should not be applied. One is for areas declared to be of national interest and significance, which ought to have very restrictive measures defined by national authorities not associated with the land use and development process. The other is for those areas belonging to, and actively controlled by, aboriginal peoples, who should be the rulers of the activities on their territories and of how their land is used. However, environmental impacts that take place within these territories should continue to be regulated by the state.

**Advantages and Limitations of Land Use Planning**

Land-use regulation leads to reduced emissions from transportation systems, less average commuting time, cultural flowering in new public spaces, less crime, and most importantly, a much greater capacity to be informed about one’s city and a greater capacity to broadly communicate the advantages of such regulation. This, in turn, leads to a less corrupt government, a very strong citizen-participation system, a much greater flow of information, and a much more intelligent use of it by citizens and organizations (Condon and others 2009). Furthermore, if the mechanisms and principles of land use planning are applied correctly, they should yield developed areas with densities sufficient to support mass transit, and increase the number of public transit trips while reducing their length. Additional benefits include reduced emissions of greenhouse gases and discharges of water and solid waste, and increased greenery in urbanized areas, thus increasing capacity to capture some of the emissions. In the long run, this should slowly yield patterns of human behavior that lead to better health and fewer deaths from transportation accidents, diabetes, lung cancer, and coronary disease. Numerous studies have demonstrated the relations between land use, transportation, and public health.

Land use planning can give rise to some complex phenomena that can exacerbate the pollution levels typically seen in developing countries. Often, large informal settlements arise on the fringes of decaying parts of urban or rural areas that are mainly residential but often industrial. This gives rise to a number of social issues as well as environmental degradation. Traffic and congestion patterns, frequently the result of a population commuting long distances on unfinished or unregulated mass transit systems, greatly affect air quality in urban space, and thus quality of life. In addition, land use planning is limited by governmental capacity. For instance, a government may lack the ability to protect the environment or to provide proper handling of residues and byproducts. Finally, the aggressive nature with which some governments promote their economy by recruiting businesses and industries to their jurisdiction without regard for negative environmental externalities can lead to larger environmental problems.
Interaction with other Tools and Possible Substitutes

Policy makers should define the land use plan and its institutional setting in close relation to the tools defined in the World Bank Guidance Note series on tools for effective pollution management. The land use plan should also be defined in relation to the following tools pertaining to governments:

- **Setting priorities**, a process that consists of determining and stating a national-level framework for integrated land management, as well as determining and stating the national government’s perspectives regarding key land uses and decisions.
- **Environmental Assessment**, to ensure that the land use plan requires developers to conduct these assessments and incorporate those conclusions into their projects prior to planning and construction approvals.
- **Strategic Environmental Assessment**, so the land use plan is subject to this type of assessment, and so the land use plan incorporates all of that assessment’s policies and measures.
- **Industrial estates**, to guarantee that the land use plan incorporates the lands, procedures, practices, and regulations associated with the establishment and operation of industrial estates.
- **Environmental Regulation and Standards, Monitoring, Inspection, Compliance and Enforcement**, in that the plan and zoning code include all relevant standards.
- **Market-based instruments and taxation policies**, to ensure that the planning authorities incorporate and effectively apply the numerous land management instruments mentioned in this Guidance Note in order to formalize policies and procedures, and bring about a more equitable land market.

Practical Examples of Land Use Planning and Lessons Learned

The Colombian municipality of Soacha, located south of Bogotá, suffered from a disordered system of land uses. In 2007 a group of development promoters became convinced that, if used properly, traditional land development resources such as easements would be able to finance urbanization in Soacha with the highest standards in public space, roads and infrastructure, community services and, of course, housing. Ciudad Verde emerged after a two-year process of negotiation involving promoters and local and national authorities that allowed assembly of 328 hectares and administration of the public funds generated by the project. It will include a network of roads, pedestrian paths, bicycle paths, environmental protection areas, water bodies, and canals, consisting of 55 hectares, or 16% of the area.

Concerning land use planning, Bogotá issued Law 388 in 1997, which mandated the fair distribution of the costs and benefits of development throughout the areas where it was to take place. The law also granted the category of public function to the entire urbanization process. This included not only the construction of utilities, infrastructure, or the provision of social housing, but everything that happens in the land-development process. Legislation
was subsequently passed to create a special framework for the capital to manage its finances, land administration, service delivery, and public works. The government then implemented a massive citizen education and culture program. Also included were numerous tools for managing traffic, de-arming and anti-violence programs, the multiplication and extension of the bicycle paths, and the launching of the Bus Rapid Transit (BRT) system. Next, they built a remarkable system of public libraries and public schools, and invested millions in restoring waterways and corridors. These efforts combined to increase the compact, complete, conserving, comfort, coordination and collaborative characteristics of Bogotá (Condon and others 2009).

In 1992, lecturers and students at the National University in Manizales initiated a community training program for the environmental management of Olivares, a very poor community on the city’s margin. However, the top-down nature of this first approach limited its legitimacy among the local population. Eventually, the project had to be reformulated to give greater autonomy and leadership to the community. Gradually, through a constant dialogue between the municipality and the local administrative board, some of the credibility that the municipality had lost in the eyes of the community was regained (Velasquez 1999).

To combat potential challenges to land use planning, governments should continue following the example of developed territories that apply principles and good practices discussed in this Guidance Note. Governments should continue to design land use plans with bold provisions for mixture and density. These plans should maximize the potential capacity of existing road grids, the potential demand on existing mass transit corridors, and bring different land uses and the population’s different socioeconomic strata together. This should increase accessibility to and from work places, reduce stress on the road system and average length of trips, and reduce pressures for additional, rural land to be incorporated to the urban setting.

Governments should work on addressing immediate challenges. This approach is less related to creating a plan and much more related to how a plan is implemented. The emphasis should be on developing effective mechanisms for adherence to the plan, maintaining oversight, encouraging public participation in the process, and ensuring that the land use plan is an evolving policy that reflects the community’s sentiments.

References and Resources on Land Use Planning

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Industrial Estates

Introduction

Environmental regulators have access to a large set of policy tools and instruments to create incentives for industrial facilities to abate pollution. Command and control is one approach where pollution standards for emissions or effluence are set, and fines and penalties are assessed against non-compliant facilities. Other options include pollution charges, tradable permits, voluntary participation programs, as well as environmental performance rating and public disclosure programs. For related information, see the other World Bank Guidance Notes in this series on effective pollution management and World Bank (2000) for reviews of these programs.

Historically, industrial estates have been established to facilitate and promote industrial and economic development. Such regrouping of industrial facilities onto a narrowly defined location offers additional opportunities. These include the chance to improve the facilities’ environmental performance in a cost-effective manner by allowing facilities to share common waste-treatment facilities. Furthermore, such regrouping allows companies to exploit opportunities where one firm’s waste becomes another’s input. More recently, industrial estates have also been promoted for the explicit purpose of facilitating the relocation of industrial facilities from densely urbanized areas where high land prices may not justify the industrial use of such space, and where populations living in close proximity to industrial firms may be more directly exposed to adverse environmental effects.

While the term “industrial estates” is used to refer to this particular regrouping of industrial facilities, the term “industrial parks” is also used to refer to the same concept. On the other hand, the term “industrial zones” refers to an area of land set aside for industrial facilities without the explicit purpose of facilitating or promoting the provision of common infrastructure and services (UNIDO 1997).

Description and Application

An industrial estate is a specific area (tract of land) that is separated from urban and densely populated areas, and zoned specifically for the location of industrial facilities. Industrial estates must support proper infrastructure such as roads, power, water supply, and other utility services to all facilities located within the well-defined parameters of the estate.
National and local authorities may support the promotion and establishment of industrial estates by encouraging foreign direct investment, redistributing employment and production away from densely urbanized regions, and accelerating regional development. Industrial estates may attract industrial facilities by offering an attractive package of services (such as power and water) that can be supplied continuously, reliably, and at a cost that industrial facilities could not achieve on their own. This package of services is often complemented with various forms of preferential investment incentives such as exemptions from import or export duties, income tax exemptions, and various other subsidies. Furthermore, industrial estates also generally offer a “one-door” policy aimed at facilitating the licensing and permitting process of new industrial facilities.

In recent years, a small number of industrial estates have proactively promoted trade and exchange among industrial facilities located within the estate, including the trading of waste; such facilities are sometimes referred to as “locators”. This has given rise to the concept of eco-industrial estates (also known as eco-industrial parks). Based on the principles of industrial ecology, the *Eco-industrial Park Handbook for Asian Developing Countries* defines the eco-industrial estate as a “community of manufacturing and service businesses located together on a common property. Member businesses seek enhanced environmental, economic, and social performance through collaboration in managing environmental and resource issues” (Lowe 2001, sec. 1.2). Hence, the eco-industrial estate differs from the typical industrial estate because it not only offers the possibility of sharing common pollution-control services and facilities, but also explicitly aims at promoting the exchange of goods, services, material, energy, water, waste, and by-products. Owners and operators of an eco-industrial estate explicitly seek enhanced economic and environmental performance through the proactive management of environmental issues. A key benefit of this approach is energy recovery as well as waste recycling and minimization (Schlarb 2001).

However, it has been noted that an effective waste-exchange “market” may be constrained by unreliability in the quantity and quality of waste supplied. Furthermore, the presence of a waste-exchange market may reduce incentives for waste prevention. Finally, implementation of industrial ecology principles into eco-industrial estates requires the careful selection of specific industrial firms. These organizations must be picked from specific sectors of industrial activities that can indeed create this industrial symbiosis among the locators. The effective planning and management of eco-industrial estates is therefore a demanding process. This may explain why, with a few exceptions, eco-industrial estates remain a small proportion of the sector.

**Prerequisite Factors**

Industrial estates may facilitate the development of a more competitive and cleaner industrial sector, especially in circumstances where there is effective integration of environmental and industrial development policies. The promotion of industrial estates (and eco-industrial estates) is an important
component in the set of policy tools that public authorities have available to achieve given targets of pollution abatement and improved ambient environmental quality. However, for industrial estates to achieve their potential as effective instruments for environmental management, a number of conditions must be met.

**Location.** If the primary purpose of industrial estates is to enable industrial development, then these estates must be located to maximize access to markets (inputs and outputs). Additionally, it must be recognized that large quantities of wastewater, air emissions, and solid waste will be produced from this concentration of a large number of industrial facilities. Therefore, to avoid becoming a pollution hotspot, an industrial estate must have space to accommodate proper treatment facilities and have adequate disposal. The geographical location of industrial estates should be part of an overall land-use development plan and should be accompanied by appropriate land-zoning regulations and a cumulative impact assessment of the development area.

**Selection of industries.** The effectiveness of the environmental services provided by industrial estates depends significantly on the industries. More precisely, the compatibility of a facility’s waste with the environmental services and waste treatment provided by the industrial estate is of the utmost importance. Industrial estates should carefully plan the nature of environmental services to be provided by the estates and carefully select the industrial facilities by waste characteristics. There must be clear and strict regulations limiting entry to the estate.

**Environmental management systems.** It is good practice for industrial estates to develop credible and practical environmental management systems (EMS) for the whole of the estate. The EMS should clearly define explicit environmental policies and rules for the estate, environmental performance objectives and targets, mechanisms by which these objectives and targets will be implemented, and a monitoring and enforcement regime aimed at achieving compliance with the objectives and targets.

**Strong environmental regulator.** The promotion of industrial estates does not alleviate the need for a strong environmental regulator, adequately resourced with budget, staffing, and legal authorities, to undertake all that is necessary to avoid industrial estates from turning into pollution hotspots.

**Synergy between industrial and environmental policies.** Practice shows that in many developing countries, pro-growth industrial policies that promote the development of industrial estates occasionally take a step further by shifting the oversight of the estate’s environmental operation to an agency that lacks the capacity to effectively oversee the industrial estate’s environmental management and performance. Shifting most or all monitoring and enforcement mandates onto such ill-equipped agencies, or occasionally onto industrial estate managers themselves, is generally not conducive to improved pollution control. Unless environmental management objectives are effectively mainstreamed, and integrated into industrial development policies,
the effectiveness of industrial estates as an environmental management tool could be limited.

**Advantages and Limitations**

From an environmental management perspective and under certain conditions, such concentration of industrial activity in a single location can offer important benefits for both the industrial facilities located within the estate and environmental regulators.

**Advantages for industrial facilities.** For industrial facilities, the industrial estate is in a position to offer infrastructure and services for which there are significant economies of scale. One example is the use of a common wastewater treatment facility, which would allow for economies of scale to be gained from the collection, treatment, and disposal of solid and toxic waste. Use of such a shared facility would also allow for the provision of effluent monitoring and laboratory services. Industrial facilities may benefit from reduced monitoring and pollution-control costs by sharing a common set of environmental services. Owners and operators of industrial estates recover the costs of providing these environmental services either through their rental rates or by means of user fees set per unit of environmental services consumed (see box 1). It is important to note that user fees may create disincentives for industrial units to use the common waste-treatment infrastructure effectively, especially in the absence of strong institutional capacity to monitor the behavior of the firms located within the industrial estate.

**Box 1. Thailand Industrial Estates Act B.E. 2522**

Section 37 of the Act gives power to the Minister of Industry to issue ministerial regulation prescribing rules, methods, and conditions for the setting up of industrial estates. According to the latest ministerial regulation issued under this section in 2005, operators of industrial estates are required to arrange for infrastructure systems, facilities, and necessary services as appropriate for each type of industrial estate, including wastewater treatment facilities. The services and facilities provided must meet standards prescribed by rules issued by the Industrial Estate Authority of Thailand (IEAT). Section 12 gives IEAT the power to set appropriate fees for the rental of immovable and movable property, maintenance of facilities, and services provided in an industrial estate to generate sufficient funds for the operation of that industrial estate. Section 14 gives IEAT the power to determine the service fees for facilities and services provided in that industrial estate, taking into account the appropriate business rate. The same rule applies where an industrial estate has been developed by a private person or entity.

**Advantages for environmental regulators.** From the point of view of environmental regulators, industrial estates (including eco-industrial estates) offer three important benefits. First, in circumstances where the explicit purpose of industrial estates is to relocate existing industrial facilities from urban centers and densely populated areas, industrial estates deliver improved ambient environmental quality in the areas from which they are being removed.

Second, industrial estates may be of particular interest to small and medium enterprises (SMEs) whose size often inhibits their use of effective pollution-control
technologies. With the regrouping of SMEs into industrial estates and by providing common environmental services, environmental regulators may achieve significant pollution control for this particular category of enterprises, which would otherwise remain a difficult and elusive task. It is important to recognize that SMEs may resist such relocation if the alternative to relocation continues to be no pollution control with impunity. The lack of a strong enforcement regime to overcome such resistance may imply that such relocation be generously subsidized and that pollution-control costs within the industrial estate be scaled from the larger to the smaller facilities.

Third, environmental regulators need not be concerned with the pollution discharge of each individual plant located within the estate, but only with the discharges from the common facility, thereby considerably decreasing the time and resources required to monitor and inspect the pollution discharged from a large number of facilities. Similarly, the enforcement of environmental laws and regulations targets only the provider of environmental services as opposed to a large number of single industrial facilities dispersed over a large area. This is a significant benefit for the environmental regulator, given that resources devoted to the monitoring and enforcement of environmental regulations have generally been recognized as insufficient relative to the task’s complexity and magnitude.

**Limitations.** Industrial estates may thus offer important benefits for both the regulated community of industrial facilities and for environmental regulators. However, despite these apparent benefits, industrial estates are typically not presented as shining examples of proper environmental management. Two notable caveats will be discussed. First, not all pollution-control services offer the possibility of large economies of scale. Such is the case, for example, for the control of air pollution. Hence, the nature and extent of the benefits associated with reduced pollution control will vary greatly and depend on the specific nature of the pollutants of concern.

Second, the concentration of a large number of industrial facilities in a specific and narrowly defined area may be a source of significant environmental damage, and may increase environmental health and safety risks if pollution discharges from the industrial estate are not strictly controlled. Hence, the environmental benefits that may result from industrial estates will not be realized unless there is a strong environmental management system for the estate and a willingness to implement the estate’s environmental rules. Owners and operators of industrial estates are first and foremost industrial promoters working within the context of an industrial development strategy. Incentives are always oriented towards maximizing the value of industrial output. As a result, these environmental benefits will not be realized without sufficient capacity on the part of the environmental regulator to monitor pollution discharges along with the willingness to enforce environmental regulations. As an example, industrial estates competing with one another to attract new locators may have incentives to reduce environmental
services fees thus jeopardizing the financing and delivery of effective pollution-control technologies. If this were to be of significant concern, it may be of interest for environmental regulators to establish minimum environmental service fees that all estates must implement.

**Interaction with Other Tools and Possible Substitutes**

Effective industrial estates require adequate planning, effective management, and a strong regulatory monitoring and enforcement regime. This may especially be the case where the establishment of industrial estates responds essentially to profit motives of land developers, thus leaving environmental management to an afterthought. Proper development of industrial estates should include strategic environmental assessments, environmental impact statements, life cycle cost analysis, land use planning, and risk management tools. See World Bank *Guidance Notes* on these tools for more information.

**Practical Examples of Industrial Estates and Lessons Learned**

*Vietnam.* Vietnam’s Ministry of Planning and Investment has a strategic plan to develop industrial estates, with a vision to the year 2020. Their plan is to achieve an annual average growth rate exceeding 20%. The ministry expects that companies sited in industrial estates will experience a 17.7% increase in output in the near term. Furthermore, such companies are expected to increase their share of Vietnam’s industrial exports from 19% to 35% in the near term (Dore and others 2008, 12).

*Denmark.* The most often cited example of implementation of the concepts of industrial ecology principles is the Kalundborg estate in Denmark. The key component of the estate is a 1500 MW coal-fired power plant that exchanges waste products with other industrial facilities of the estate (for example, fly ash to a cement factory; steam to a pharmaceutical plant, recovered heat to fish farming, and sludge to a fertilizer facility). However, evidence indicates that this system of exchange gradually emerged from a sequence of independent actions as opposed to having been carefully designed, planned, and implemented (Ehrenfeld and Gertler 1997).

Other examples of eco-industrial estates are the Dalian Industrial Estate (China), and the Naroda Industrial Estate (Gujarat, India). Asolekar and Gopichandran (2005) presents further examples as well as case studies.

**References and Resources on Industrial Estates**


Environmental Licensing*

Introduction

Environmental licensing is a tool that a public authority can use to prevent, control, and manage pollution. It is also an instrument for territorial and land use planning. Environmental licensing should be viewed as an integral part of the planning process for controlling activities that potentially cause pollution and significant environmental impacts. It aims at integrating environmental protection into the development process in order to achieve sustainability (see figure 1). Thus, it is in accord with Principles 4, 8, and 11 of the Declaration of the UN Conference on Environment and Development (1992) and Principle 17 of the Declaration of the UN Conference on the Human Environment (1972).

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Figure 3. Schematic of Relations among Planning Processes and Pollution Control

Description and Application of Environmental Licensing

Environmental licensing is a tool to regulate activities that may cause harmful pollution or environmental degradation. It sets legally binding requirements to protect human health and the environment through a public and transparent process. Environmental licensing should be carried out by a public environmental authority prior to the approval of projects in order to prevent, reduce, or compensate for the environmental impacts of human activities.

This tool for protecting the environment takes into consideration the regulation of land use, especially zoning rules, to ensure the most appropriate use of a property, the long-term quality of the land, and the densities at which particular activities can be performed on a site. It also improves the economic planning process by coordinating private activities...
that are desired by the government and the local community. Such activities include creating job opportunities, improving infrastructure, and augmenting the tax base. Good environmental licensing systems employ the “assess and prevent” approach that should prevail over the traditional “react and remedy” model of public management, because it is more effective and efficient to prevent, rather than try to cure, damage to the environment.

The cornerstone of environmental licensing is an environmental assessment that enables a public authority to evaluate an activity’s environmental impacts. Environmental licensing should not be seen as an obstacle to economic development, but as a supportive mechanism for achieving growth on a sustainable basis. In most cases, the private sector says “what” and the environmental public authority says “where and how.” It is a dynamic tool that should be adapted to fit the specific characteristics of proposed development projects.

**Application scope.** Environmental licensing is best applied when preceded by (1) environmental baselines and assessments; (2) development planning; and (3) territorial and land use planning. These tools shape the broad context within which the technical assessment fits and they avoid consideration of political and economic issues by the environmental authority during the licensing process.

The targets of environmental licensing are activities that potentially cause pollution and significant environmental impacts. Listed below are categories and examples of such activities:

- Industrial developments (manufacturing industries, landfills, oil and gas exploitation, mining)
- Infrastructure projects (roads, airports, electric power plants, settlement and housing projects)
- Urban constructions (shopping centers, university campuses)
- Agricultural and forest activities (cattle raising, timber logging).

The activities submitted to environmental licensing should be assessed in accordance with the legal and economic criteria of each country.

Simplified licensing processes should be applied to small and medium enterprises (SMEs), such as gas stations and other SMEs that cause negligible environmental impacts. What determines whether to use a simplified procedure or not is the activity’s impact, since SMEs such as gas stations are not necessarily insignificant sources of pollution. However, in cases where the impact is negligible, the licensing process should be based on a simplified environmental assessment study, and consultation with stakeholders may be conducted in a less complex manner than a public hearing.

Another tool that may be applied to activities that cause low environmental impacts is self-licensing. In this approach, the project proponent gives the environmental agency a declaration of the project’s environmental feasibility, and an operating license is
issued under conditions set by the agency. During the period of validity of the license, the environmental agency maintains oversight of the project’s impacts and supervision of the project’s activities.

**Application process.** The environmental licensing process should be carried out by an environmental or similar agency endowed with (1) autonomy; (2) financial resources; (3) technical capacity and well-qualified human resources to analyze sources and impacts of pollution projects; and (4) legal competence to apply the environmental legal and regulatory framework. In some countries, like Thailand, the sector agency can be both the licensing authority and promoting agency, which creates a potential or perceived conflict of interest. It is crucial to elucidate the different roles of each agency.

The agency should develop procedures encompassing the following steps in the application process:

1) Submission by the applicant of a form describing the proposed activities, sources of pollution, related potential environmental impacts, proposed monitoring procedures, and emissions control techniques.

2) Analysis of the project’s impacts. If significant environmental impacts are anticipated, Terms of Reference should be issued to study and assess those impacts.

3) Disclosure of information that has been collected and consultation with stakeholders such as NGOs and authorities with related interests.

4) Granting or denial of the environmental license. An approval involves two specific licenses: (a) an installation license authorizing project construction; and (b) an operating license authorizing project operations, upon confirmation that the project’s construction conditions were met.

5) Mandating of technical conditions on the operating license, such as regular reports about emissions and notification of unusual events like discharges that exceed limits or accidents.

6) Monitoring with periodic review of the operating license to determine if that license will be renewed.

The environmental agency should state the operating license’s period of validity. Good practice suggests a period ranging from 4 to 10 years, according to the project’s characteristics and the monitoring procedures adopted. A short period of validity may cause unnecessary increases in bureaucracy. Regardless, the environmental agency should have the competence and authority to review an existing license at any time, especially if important new information becomes known. Figure 2 gives an overview of the application process.
There are additional factors to consider:

1) Time limits are needed for each stage of the procedure. There should be enough time to process the license, but the timetable should not unduly constrain the investor.

2) The license should be issued with technical conditions and requirements that aim to internalize the project’s environmental costs, in accordance with the polluter pays principle.

3) Project proponents and opponents should have the right to appeal to an administratively superior authority empowered to review either the refusal or the issuance of an environmental license. The environmental authority’s analysis of the proposed project should answer the following questions:

   1) Is the proposed activity legal?
   2) Is it planned for an area in which such projects are allowed?
3) Is the proposed technology environmentally adequate?
4) Do projected emissions comply with the emission limits and environmental quality standards?
5) Can the proposed emissions standards be improved?
6) Which pollution control and mitigation measures should be adopted?
7) Should compensation measures be adopted for potential irreversible damages to the environment? Are there other considerations (such as indigenous, vulnerable populations) to take into account?
8) What measures are proposed to restore the site after the project ceases operations?
9) What time frame and technical criteria are appropriate for operating license renewal?

6) Clear guidance for identifying stakeholders and providing public access to information and participation (Principle 10 of the Declaration of the UN Conference on Environment and Development, 1992)

Advantages and Limitations of Environmental Licensing

Advantages. Environmental licensing prevents or minimizes the release or discharge of toxic pollutants into the environment, ensures compliance with environmental and public health standards, encourages pollution prevention, waste minimization, and cleaner production, and promotes planning and development in an environmentally sustainable manner.

Limitations. Environmental licensing most importantly, may increase the length of time and technology required for project implementation, may increase bureaucracy, may increase the project’s costs, and risks becoming a mechanism for rent capture rather than for pollution control.

An activity that has gone through environmental licensing can still cause pollution, especially when that activity’s operations are out of compliance with its environmental license. This tool may require modification or exemption when applied to strategic military projects, emergency measures for environmental catastrophes, land tenure regularization of consolidated human settlements,
and projects with negligible or no environmental impact.

**Interaction with other Tools and Possible Substitutes**

Environmental licensing interacts with other governmental policies and programs such as hydro resources policy, economic and territorial planning, energy and mines policy, transportation policy, and health and safety directives. Where such interaction is needed, the following tools are recommended.

*Strategic environmental assessment (SEA).* This is a tool for use at the governmental authority decision level. The objective of the SEA is to assess the environmental impacts of governmental policies, plans, and programs. It identifies the environmental issues at stake and it defines the critical decision points subject to analysis by the governmental authority. Preliminary stages of the licensing process may be skipped and replaced by the outcome of the SEA. SEAs are used to define the planning process and influence policies upstream from the licensing decision at the project level. Environmental licensing of a certain activity is at its best when it fits the SEA’s goals, programs, and plan of action.

*Sector agencies’ interaction with the environmental licensing process.* If a proposed project requires authorization from a sector agency (for example, in the case of mining, or oil and gas activities), the sector agency would typically liaise with the environmental agency to exchange information and contribute to the environmental licensing process. During the licensing process, the sector agency (1) is expected to comment on, or require additional information regarding, the EIA; (2) is required to attend one or more public hearings regarding the proposed license; and (3) may have to deal with technical requirements imposed by the environmental agency.

*Environmental impact assessment (EIA).* An EIA operates at the environmental authority’s decision level and aims at evaluating projects with significant environmental impacts already listed in the legal or regulatory framework. The environmental authority should incorporate recommendations for mitigation measures proposed in the EIA relating to conditions for the permit. Following submission of the proposed project, the environmental agency issues a Term of Reference that defines the specific subjects that the EIA must cover. When it has been completed, the EIA is submitted to the environmental agency for analysis. The agency may require the project’s proposer to submit additional information or clarify statements in the EIA. Once the analysis of the EIA is completed, a public hearing takes place for discussion of the project.

*Environmental compliance and inspection tools, such as audits and monitoring.* At the level of technical decision making, environmental compliance and inspection tools should be employed to monitor the operation of the licensed activity. These tools help evaluate whether the operation complies with the technical conditions of the environmental license and may be applied in the process of renewal of the
operating license. Environmental public audits may serve as a tool to verify whether the licensed activity is complying with the technical conditions set forth by the environmental agency. When the project fails to comply with the technical conditions set for its operation, the environmental license may be subject to revocation. Civil, administrative, and criminal sanctions may also be applied.

Practical Examples of Use of Environmental Licensing and Lessons Learned

Environmental licensing of pollution sources in saturated areas. Industrialized and urban areas are often saturated with gases that cause air pollution as oxides of nitrogen, carbon monoxide, particulate matter, or oxides of sulfur. To maintain air quality standards, new sources of emissions may be required to use the best available technology for pollution control in order to comply with emission limits. In some countries there are market schemes to enable the offset of emissions by acquiring emissions reduction credits from construction that achieved reductions below the emissions limits. The RECLAIM (Regional Clean Air Incentives Market) Program is the world’s first comprehensive market program for reducing pollution. It was adopted by the South Coast Air Quality Management District in the United States in 1993. Trading schemes combined with environmental licensing give the private sector flexibility in deciding how to reduce emissions.

Social issues in licensing hydroelectric projects. An example of these issues is the licensing process for construction of Brazil’s Belo Monte Hydroelectric Project planned for the Xingu River. This project aims at generating 11,100 MW of electricity with a reservoir of 440 km² in the Amazon forest. Approximately 19,000 residents, including indigenous people, are going to be displaced or otherwise affected by the project. A study estimated that the social and environmental costs arising from the licensing process average about 12% of total plant costs (World Bank 2008). About four-fifths of those social-impact costs will be required for population resettlement, support to communities and municipalities, and supplying infrastructure. The costs associated with the physical environment represent only 2% of total project costs.

Public consultation. The Canadian Environmental Assessment of Integral Studies sometimes includes citizen participation in open meetings, advisory committees, liaison offices, or site visits. For the Aquarius Mine project, there were open meetings before and after the preparation of the Environmental Impact Assessment (EIA). All participants involved in the project met with a group of technical experts and advisers, largely funded by the company (www.idrc.ca). In a more preventive approach, Chile has developed a specific guide for preliminary citizen participation during the Environmental Impact Assessment that involves owners of investment projects. The guide is intended to avoid, at the beginning of the project, the creation of conflicts between local people and businesses, and the creation of fear and mistrust, since once such negative attitudes have become present, they are difficult to overcome.
Multi-jurisdictional approach to environmental assessment. Environmental licensing as a tool for environmental decision making may involve the overlapping interests of different levels of governments and institutions. A project may need to be submitted to more than one public authority, and those different authorities may apply distinct environmental licensing procedures. Canada has considered three approaches to inter-jurisdictional coordination of environmental assessment: (1) standardization through one common procedure used across jurisdictions; (2) harmonization through bilateral agreements between governments or project-based agreements; and (3) substitution of federal authority to take the pace of local governments when a project is subject to federal review.

Revenue generation from license fees. In Brazil, a fee is paid to cover the expenses of an environmental agency assessment. To avoid transforming this tool into just a source of government revenue, regulations define the activities that must be done in the EIA, which is the most expensive type of assessment carried out by that agency. For activities with significant environmental impacts that cannot be remedied or minimized, project owners must pay a fee for environmental compensation.

References and Resources on Environmental Licensing


This guidance note is part of World Bank Group publication: Getting to Green—A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
Market-Based Instruments / Economic Incentives*

Introduction

This note provides guidance on the use of market-based instruments (MBIs) for pollution control. MBIs, by implementing an explicit or implicit price on emissions, create financial incentives for pollution control. These instruments use market signals to affect the behavior of both consumers and firms towards pollution. MBIs are also called economic incentives (EI) for pollution control and include pollution charges or levies, taxes, subsidies, and tradable permits.

Market-based instruments create incentives for firms to adopt low-cost technological or process innovations for pollution control. From a theoretical standpoint, “...if properly designed and implemented, market-based instruments allow any desired level of pollution clean-up to be realized at the lowest overall cost to society, by providing incentives for the greatest reductions in pollution by those firms that can achieve these reductions most cheaply” (Stavins 2003, 359).

Description and Application of Market-Based Instruments / Economic Incentives

Table 1 (adapted from Blackman and Harrington 2000) classifies pollution control instruments into two categories: direct and indirect. This classification compares major elements of MBIs with command and control (CAC) instruments. The use of direct instruments requires the regulator to monitor the emissions. MBI fees and levies can be grouped in one category, the charge system. Pollution charges are either fees or taxes applied as a proportion of the amount of pollution that a source generates. These are taxes levied on market activities that generate pollution or other negative spillover costs not covered in an item’s price. Both an MBI charge system and an MBI tax system use financial instruments to persuade polluters to reduce pollution. In both systems, the regulator attempts to make pollution more costly to the polluter.

* This guidance note was prepared by Salvatore Di Falco (Consultant). Peer reviewers included Glenn-Marie Lange (Senior Environmental Economist, ENV), Hua Wang (Senior Environmental Economist, DECEE), Katelijn van den Berg (Senior Environmental Economist, ECSSD), and Tijen Arin (Senior Environmental Economist, ECSSD). Additional comments were provided by Alberto Ninio (Chief Counsel, LEGEN), Giovanni Ruta (Senior Environmental Economist, ENV), Jouni Eerikainen (Senior Evaluation Officer, CEXEG), Nina Chee (Senior Environmental Specialist, MIGA), and Suiko Yoshijima (Consultant, MNSEN). Editorial assistance was provided by Stan Wanat (Consultant), Juliette Guantai (Program Assistant, ENV) and James Cantrell (Communication Analyst, ENV). The task team leaders for this product are Kulsum Ahmed (Lead Environment Specialist, ENV) and Helena Naber (Environmental Economist, ENV). The product was prepared under the guidance of the following World Bank Group management: James Warren Evans / Mary Barton-Dock (Directors, Environment Department, World Bank), Bilal Rahill (Senior Manager, IFC), and Frank Lysy / Ravi Vish (Director, MIGA).
Table 1. Classification of Instruments

<table>
<thead>
<tr>
<th>Regulatory Tool</th>
<th>Direct Instruments</th>
<th>Indirect Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market-Based Instruments / Economic Incentives</td>
<td>Emission fees; Tradable permits</td>
<td>Taxes; Subsidies</td>
</tr>
<tr>
<td>Command and Control</td>
<td>Emissions standards</td>
<td>Technology standards</td>
</tr>
</tbody>
</table>

**Emission Fees.** Regulators may impose on polluters a direct charge for the emissions they produce. In an MBI charge system, the regulator sets up a standard for a pollutant, and a plant incurs a penalty when it exceeds the standard.

** Tradable permits.** Regulators may use tradable permits and create a market for pollution. In theory, they can achieve the same cost-minimizing allocation of the control burden as a charge system, while avoiding the problem of uncertain responses by firms (Stavins 2003). In a tradable permit system, an allowable overall level of pollution is established and subsequently allocated among firms in the form of permits. Firms that keep their emissions below their allocated level may then sell their surplus allotment to other firms or use them to offset excess emissions in other parts of their facilities (Stavins 2003). While the implementation of these tools has become widespread, there is no tendency towards replacing the basic regulatory approach with a purely economic one. “Economic instruments are complements mostly and substitutes only sometimes for other types of approaches” (OECD 1994, 187).

**Taxes.** Regulators may impose taxes which are similar to the direct emission fees, however taxes are indirect instruments. Because taxes do not require the regulator to determine an abatement level, they are easier to implement. Taxes seem appropriate in the context of fuel use and choice. Air pollution control has been addressed in policies aimed at discouraging the use of private transportation during peak hours. Evidence from Costa Rica showed that the choice between public and private transportation by commuters reflected the cost of transportation mode. Increases in cost per car trip affect transport substitution, although this effect seems small. Increases in other costs such as parking do not seem to be as effective as expected. In 1990, a USAID study estimated that by age seven, Bangkok children collectively suffered a loss of up to 700,000 IQ points as a result of elevated blood-lead levels (O'Connor 1999). This research prompted the Thai Government to introduce unleaded petrol at a slight discount relative to leaded petrol, subsidizing the former through a surtax on the latter (O'Connor 1999). Moreover, the Thai Government introduced a regulation in 1993 requiring all cars sold in Thailand from that date forward to be equipped with a catalytic converter; these measures resulted in the market share of unleaded petrol rising to almost 50% in the following few years (O'Connor 1999).

There is evidence from Santiago, Chile, that consumers responded to changes in relative prices by switching to lower-priced natural gas (Coria 2009). This supports the use of taxes on non-clean fuels. Even if such taxes do not create incentives to abate emissions per se, they might create incentives to use cleaner fuels and reduce emissions. This approach
also provides for ease of administration, because collection of revenues would be implemented via tax collection institutions (Blackman and Harrington 2000). Moreover, consumption of fuel is usually much easier to monitor than emissions. Taxes generate revenues for governments. These revenues can be used to fund investment in projects. Nevertheless, taxes can be politically difficult to put in place. Taxes need to be high enough to create a disincentive that then translates into environmental benefits. Moreover, it is possible that the taxes will be regressive, hence particularly affecting the poorer part of the population. Decision makers may find this unappealing. The issue of potential regressivity of fuel taxes is addressed in box 1. Furthermore, the successful implementation of taxes needs proper enforcement. An example is the forestry tax in Brazil and Colombia, a tax charged for wood consumption when the harvesting is not compensated for by reforestation activities. This may be seen as an incentive to curb deforestation. Its enforcement, however, has been very weak. Therefore the tax did not seem to affect the deforestation rates nor provide important budgetary benefits (Seroa da Motta and others 1999).

Subsidies. Regulators may impose subsidies to induce reductions in pollution. Among the subsidies that may be used to help manage environmental pollution are grants, low-interest loans, favorable tax treatment, and preferential procurement policies for products believed to pose relatively low environmental risks. Subsidies for environmental management are, however, sometimes criticized because they can be viewed as a prize given to polluters. Thus, such subsidies may be seen as helping to bear costs that should be the polluters’ responsibility. Subsidies for resource input have been successfully implemented in Latin America. Reforestation subsidies, for instance, have been an important driver behind Chile’s forestry sector expansion, while energy subsidies in Barbados and Ecuador seem to have expanded the use of cleaner substitutes (Seroa da Motta and others 1999).

Other environmentally related subsidies, such as federal support for timber harvesting in national forests, are criticized because they have proven harmful to the environment (Seroa da Motta 2006). Nonetheless, subsidies have become a fairly common tool to manage the environment at every level of government. Eliminating environmentally harmful subsidies can be even more effective when used to improve environmental quality. In the early 1990s, the World Bank made the phase out of pesticide subsidies a condition for new lending to Egypt. As a result, pesticide use dropped by nearly 70% over the next five years (Anderson 2002).
One possible circumstance in which subsidies can be justified is the dissemination of new technology. Subsidies to a few early adopters of a technology that is virtually unknown in a particular region or country can help demonstrate the profitability and pollution-reduction effectiveness of a technology so that others adopt it later. These early adopters are thus compensated for taking a risk (Peszko 2005). The amount of compensation and the identification of the individuals are very important and add an extra element of difficulty in the implementation of this tool.

Deposit-refund systems. Regulators may require a monetary deposit at the time a product is sold. The deposit is eventually refunded when the item is returned. This scheme has been implemented successfully in many high-income countries. In the United States, deposit-refund systems have been applied to control the disposal of lead-acid batteries and products containing aluminum, as well as glass, pesticide containers, and tires. The private sector often creates and manages a disposal system. This system helps subsidize the return of recyclable products. Deposit-refund systems thus appear to be appropriate instruments for discrete, solid commodities. Such systems may, however, have a high cost of implementation. For instance, collecting and refunding deposits on the sale of individual products and product disposal can be expensive activities. Among middle-income countries, South Korea has one of the most exhaustive deposit systems, covering a multitude of products from packaged paper, to televisions, to washing machines.

Prerequisite Factors for Marked-Based Instruments / Economic Incentives

Strong regulatory and enforcement mechanisms, and strong institutions, are required for MBIs to function effectively. MBIs may need to be preceded by, and accompanied by, CAC actions. There are three essential phases that need to be considered by institutions or regulators in developing countries: first setting up the rules; second monitoring performance and third enforcing compliance. The achievement of these three phases can be affected by a host of problems. First of all the issues of priority in the agenda. Environment and development may be seen as substitute rather than complements and in a developing country context environmental quality can be seen as something that can be sacrificed for development. Moreover, regulatory institutions can be weak, understaffed and with lack of resources. This can impair both monitoring and enforcement phase. Finally, developing countries often have a large set of very small firms that are more difficult to monitor. Firms location may also be very spatially disperse. Besides these points, when one evaluates the implementation of MBIs in a developing country a set of issues should be considered. These issues can be represented in the figure below, and all these element add difficulties in the implementation of monitoring and enforcement:
Advantages and Limitations of Market-Based Instruments / Economic Incentives

The benefits of MBIs include flexibility and efficiency, especially since two of the most important dimensions of environmental regulations are monitoring and enforcement. In practice, MBIs are used together with command and control (CAC) instruments, which set performance targets and specify the technology to be used. Each of the various types of MBI has its own characteristics, strengths, and weaknesses (see table 2, next page).

Figure 5. The Environmental Regulatory process

- Public Sector Institutions
- Set up clear rules
- Monitoring Performance
- Enforcing Compliance

Problems
- Development vs Environment
- Political resistance
- Weak Regulatory Institutions
- Lack of Fiscal and technical resources
- Small scale firms or plants
Table 2. Success Matrix for Implementation of MBIs

<table>
<thead>
<tr>
<th>MBIs</th>
<th>Activities and requirements to establish and implement the instrument</th>
<th>Conditions for success</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge system</td>
<td>The regulator needs to:</td>
<td></td>
<td>• Monitoring data on pollutant must be available</td>
<td>• More complex to coordinate with different sources of pollution</td>
</tr>
<tr>
<td></td>
<td>• Set up clear rules</td>
<td></td>
<td>• Enforcing compliance</td>
<td>• Monitoring and enforcement are costly</td>
</tr>
<tr>
<td></td>
<td>• Collect the revenue</td>
<td></td>
<td>• Institutional integrity must be very high</td>
<td></td>
</tr>
<tr>
<td>Deposit refund</td>
<td>The regulator needs to:</td>
<td></td>
<td>• Front-end charge (deposit) combined with refund payable when quantities are turned in for recycling.</td>
<td>• Low legal, institutional, and political barriers</td>
</tr>
<tr>
<td></td>
<td>• Set up clear rules</td>
<td></td>
<td>• Participation by households</td>
<td>• No need for monitoring when voluntary</td>
</tr>
<tr>
<td></td>
<td>• Collect the revenue</td>
<td></td>
<td></td>
<td>• Difficult to enforce because of the voluntary nature of the scheme</td>
</tr>
<tr>
<td>Taxes</td>
<td>The regulator needs to:</td>
<td></td>
<td>• Enforcing compliance</td>
<td>• High cost of implementation</td>
</tr>
<tr>
<td></td>
<td>• Set up clear rules</td>
<td></td>
<td>• Institutional integrity must be very high</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Collect the revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsidies</td>
<td>• The regulator needs to set up clear rules</td>
<td>• Monitoring data on pollutant must be available</td>
<td>• Incentive to actually change system</td>
<td>• Taxpayer gets part of the pollution burden</td>
</tr>
<tr>
<td>Tradable permits</td>
<td>• The regulator needs to set up clear rules</td>
<td>• Data needed for initial allocation</td>
<td>• Flexibility in their application</td>
<td>• Major regulatory requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tracking system required</td>
<td>• Cost savings for the regulator</td>
<td>• Consistent legal framework</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enforcing compliance</td>
<td>• Less efficient units of production are likely to stop operating</td>
<td>• Political resistance</td>
</tr>
</tbody>
</table>
A number of points can be highlighted:

- There is evidence that MBI pollution charges and fees curb air and water pollution.
- These results seem to be stronger for larger units of production.
- Taxes can reduce air pollution by providing incentives for switching to cleaner energy.
- A balanced mix of regulatory measures and MBIs will effectively achieve pollution reduction targets. A prime example is the implementation of tradable permits.
- MBI requires effective systems and institutions for monitoring, and for command and control.
- CAC (through setting up standards) can be superior to MBI in some situations.
- CAC approaches may be a sensible initial approach, especially when there is limited information and environmental damage is an important issue.
- Monitoring and enforcement are very important; without both, policies have been ineffective.

Interaction with other Tools and Possible Substitutes

Command and Control (CAC) instruments are often contrasted to MBIs. By setting up standards, a CAC action can be superior to MBI in some situations. While setting performance standards through CAC can reduce some of the overall pollution, this process neglects consideration of the possible costs of holding all firms to the same target, since this can be expensive and counterproductive (Stavins 2003). A central issue to be considered is the cost effectiveness of pollution control instruments, and CAC instruments seem to impose a relatively high cost on firms (Pandey 2005).

It would be inaccurate to view CAC and MBIs as mutually exclusive or opposing approaches since, in many circumstances, these tools are complementary. Moreover, the success of MBIs depends upon an effectively functioning system for monitoring, and for command and control, including properly functioning institutions. CAC may be a sensible initial approach and be followed by MBIs. Therefore in reality CAC and MBIs can and do operate together. For example, regulators might establish a specific threshold level (a standard) of pollution, which is a CAC action, and apply a fee for the amount of pollution above that threshold, which is an MBI action.

Much recent attention has been devoted to informal, voluntary, or informational polices, all of which are complementary tools to both MBIs and CAC. The usefulness of those policies becomes clear when one considers the issues of monitoring and enforcement. The potential beneficial effect of these policies for pollution control was highlighted by the World Bank (Blackman 2009a, 2). Evidence drawn from three empirical studies of plant-level abatement practices conducted 1992–94 clearly stressed that environmental performance is strongly and positively related to external sources of pressure and community action (Blackman and Bannister 1998; Dasgupta and others 2000).
Enforcement and compliance play very important roles in environmental performance. In China, inspections dominate and better explain the environmental performance of industrial polluters. Public disclosure mechanisms in developing countries may be a useful model to consider given limited government enforcement resources. Public disclosure can affect firms’ responsiveness to industrial pollution control, as has been demonstrated in Indonesia. The role of the press has been analyzed in India. It offers a test of the hypothesis that the press can act as an informal agent of pollution control. This hypothesis was tested using monthly water pollution data from four hot spots in the state of Gujarat, India, for the period 1996 to 2000.

The study’s results show that the press can function as an informal regulator if there is sustained interest in news about pollution. The role of capital markets appears relevant as well. Evidence from capital markets in Argentina, Chile, Mexico, and the Philippines shows that they react to announcements of environmental events, such as those of superior environmental performance or citizens’ complaints. An empirical analysis of the impact of traditional enforcement and information strategies provided insights into the relative impact of traditional (fines and penalties) and emerging (public disclosure) enforcement strategies (Foulon and others 2002). Public disclosure of environmental performance creates additional and strong incentives for pollution control.

Practical Examples of Market-Based Instruments / Economic Incentives and Lessons Learned

Theoretical and anecdotal information on MBIs in developing countries is fairly extensive; however, evidence based on robust econometric analysis is limited (see table 3).
The Chinese pollution levy system is one of the most comprehensive emission charge system in the developing world (see box 2). Data on water found that China’s levy system had been working much better than previously thought (Wang and Wheeler 1996). The results suggest that pollution discharge intensities have been highly responsive to that pollution intensity has been responsive to this instrument. A variety of analyses at both provincial and plant levels estimated responsiveness of pollution to the levies for different pollutants.

**Box 2. Chinese Levy System**

In 1982, China’s State Council began nationwide implementation of pollution charges. The system is applied to hundreds of thousands of sources of air, water, solid waste, and noise pollution. The implementation has been very widespread, and year after year the number of firms participating and the revenues collected have increased. For wastewater, fees are calculated for each pollutant in a discharge stream and the polluter pays the fee associated with the highest value among all the pollutants (Wang 2002). The resources collected as levies are used to finance environmental institutional development, administration, and environmental projects, and to provide subsidies or loans to firm-level pollution control projects. Enforcement is implemented via a schedule of penalties.

### Table 3. Applications of MBIs in Developing Countries*

<table>
<thead>
<tr>
<th>MBIs</th>
<th>Issue or Source of Pollution</th>
<th>Application in Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge system</td>
<td>Industrial air and water pollution from large units</td>
<td>China, Colombia, Ecuador, Malaysia, Mexico, Philippines</td>
</tr>
<tr>
<td>Deposit refund</td>
<td>Waste management households (glass and plastic, car batteries)</td>
<td>Colombia, Ecuador, Jamaica, Korea, Mexico, Sri Lanka, Taiwan, Venezuela</td>
</tr>
<tr>
<td>Taxes</td>
<td>Air pollution mostly from large units</td>
<td>Brazil, Chile, Kenya, Mexico, Thailand</td>
</tr>
<tr>
<td>Subsidies</td>
<td>Air pollution from both large and small units</td>
<td>Brazil, Chile, Colombia, Ecuador, Kenya, Mexico, Tanzania</td>
</tr>
<tr>
<td>Tradable permits</td>
<td>Air pollution (SO$_2$) from large units, Water use by large units, Car use/congestion in megacities</td>
<td>Chile, Mexico, Singapore</td>
</tr>
</tbody>
</table>

* Bolded items signify that evidence is based on quantitative studies.
For air pollution, the results imply that emissions decline by about 0.65% for each 1% increase in the effective levy rate. Water pollution declines by 1.08% for each 1% increase in the levy. For SO$_2$ emissions alone, the estimated decline is again noticeable, 1.03% for each 1% increase in the levy. Firms’ response to the water pollution levy is focused on process change, rather than end-of-pipe removal.

A similar water pollution scheme was adopted in Colombia. The Colombia discharge fee program encountered a set of serious problems that limited its success in some regions. These included widespread noncompliance by municipal sewerage authorities, and a confused relationship between discharge fees and emissions standards. Nonetheless, Colombia’s program seems to have achieved its targets. In some watersheds, pollution loads dropped significantly after the program was introduced (Blackman 2009b).

For instance, in the ecologically sensitive area of Rio Negro, watershed water pollution from industrial sources was reduced by 28% (Sterner 2003).

In Poland, a revenue-raising charge to provide funds for environmental protection and water management on a national, provincial, and municipal scale was implemented. Pollutants targeted include biochemical oxygen demand (BOD) and chemical oxygen demand (two indicators of the physico-chemical properties of water samples), suspended solids, chloride and sulphate ions, heavy metals, and volatile compounds. In 1996 BOD decreased by 11,000 tons and insoluble substances by 71,000 tons (OECD 1999). Similar actions were taken in Estonia, Latvia (Speck and others 2006), Malaysia, and the Philippines (World Bank 1997). Box 3 presents information about MBIs in developed countries.

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**Box 3. MBIs in Developed Countries**

During the last 20 years many OECD countries have experimented with MBIs for pollution control. Charges and fees are the most popular tools (both emissions and product charges). For instance emissions charges levied on air and water pollutants have been applied in more than 20 countries. Carbon taxes in Denmark, Norway, and Sweden are intended to have an incentive effect, in addition to a revenue-generating effect, but it has been difficult to determine their actual impacts (Blackman and Harrington 2000). Claims have been made that the Swedish and Norwegian taxes have reduced carbon emission (Larsen and Nesbakken 1997). Stronger evidence is on reduction in water pollution. The Netherlands, for instance, has assessed effluent fees on heavy metals discharges from large enterprises, and organic discharges from urban and farm households, and from small, medium, and large enterprises. In some cases, the charges reduced total organic discharges by half, and industrial organic emissions by 75 percent (World Bank 2000). The most ambitious implementation of MBIs has been the control of sulfur dioxide (SO$_2$) Polluters were allowed to trade the permits or bank them. The results of the program were very good. Target emissions reductions were achieved (Stavins 2003).
References and Resources on Market-Based Instruments / Economic Incentives


Guidance Notes on Tools for Pollution Management


### APPENDIX

**Details of Studies proposing quantitative evidence**

<table>
<thead>
<tr>
<th>MBIs</th>
<th>Study</th>
<th>Country</th>
<th>Issue</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Charge system</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wang and Wheeler 1996</td>
<td>China</td>
<td>Water pollution</td>
<td>Industry highly responsive to the levy</td>
</tr>
<tr>
<td></td>
<td>Wang and Wheeler 1999</td>
<td></td>
<td>Air and water pollution (TSP COD)</td>
<td>Levy decomposition into two components: pollution intensity of process production and degree of end-of-pipe (EOP) abatement</td>
</tr>
<tr>
<td></td>
<td>Wang 2002</td>
<td></td>
<td>Water Pollution (COD)</td>
<td>Expenditures on end-of-pipe wastewater treatment are strongly responsive to the pollution charges</td>
</tr>
<tr>
<td></td>
<td>Wang and Wheeler 2005</td>
<td></td>
<td>Air and water pollution (COD TSS SO2)</td>
<td>Strong marginal deterrence effect for the pollution levy</td>
</tr>
<tr>
<td></td>
<td><strong>Subsidies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seroa da Motta 2006</td>
<td>Brazil</td>
<td>Determinant of Environmental Performance</td>
<td>Market incentives are also very influential determinants. Cost savings on inputs and subsidized credit are found equally important</td>
</tr>
<tr>
<td></td>
<td>Coria 2009</td>
<td>Costa Rica</td>
<td>Fuel expenditure</td>
<td>Large response of the rate of switching to the lower price of natural gas</td>
</tr>
<tr>
<td></td>
<td><strong>Taxes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alpizar and Carlsson 2003</td>
<td>Costa Rica</td>
<td>Transport Mode</td>
<td>Fuel taxes can also be useful to incentivize technological change and adopt alternative technologies</td>
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Labeling and Certification

Introduction

Labeling and certification are two tools that government officials may employ, in conjunction with other tools, to effectively manage pollution. These two instruments provide consumers with information that was previously unknown to them and that may alter their choices when they balance their environmental preferences with costs. Effective labeling and certification mechanisms may shift consumption and production towards socially responsible and sustainable patterns. In the long term, through the demand-side response to labels and certifications, business practices will adapt to reflect the ethical demands of their consumers.

Description and Application of Labeling and Certification

Environmental labeling. Labeling gives information about the environmental impacts associated with the production or use of a product. They are typically voluntary but may be mandatory in certain instances, for example, requiring certain toxic ingredients to be indicated on the product or mandatory energy labels for domestic appliances. While there are many different environmental labeling programs, there are three basic types of environmental labels (see box 1). Effective labeling allows a government to address a

Box 1. Types of Environmental Labels

Type I labels are labels that give consumers an indication of the overall environmental performance of a specific product compared with others within the same product category. Type I labels can address a single criterion, but are typically based on some form of Life Cycle Analysis (LCA). Because of the lack of adequate scientific knowledge, the high cost of some testing procedures, and the perception that some environmental issues deserve priority, the criteria for type I labels often involve weighted judgments. Type I labels are typically voluntary labels. (For more information, see World Bank Guidance Note on Life Cycle Analysis.)

Type II labels are any kind of declaration made by manufacturers, importers, distributors, or anyone else who is likely to benefit from a product's environmental claim. They generally address single issues without considering the environmental impacts throughout a product's entire life cycle. Type II labels are typically mandatory labels.

Type III labels are comprehensive data lists that give environmental information on a product throughout its life cycle.

specific environmental concern. “Ecomark” is a type I labeling program used in India. Initially launched by the government of India as a voluntary labeling program with criteria based on a cradle-to-grave approach, “Ecomark” has become mandatory for some products such as refrigerators and air conditioners. Energy labels, such as the EU energy label and China energy label, are type II labels used to reduce reliance on oil imports and to reduce greenhouse gases. These labels allow consumers to compare the energy efficiency of appliances before purchasing a device. In this case, consumers may compare the energy efficiency of the appliance with its cost.

Voluntary labels and specifically multi-criteria type I labels should be promoted when governments want to change behavioral patterns of consumption.

For policy makers, environmental labeling may also represent a short-term solution to a difficult regulatory problem. Labeling can become a compromise that is particularly attractive to policy makers because of its market-based character. In the long term, labeling can become one of the first steps in a government strategy of steering the behavior of producers and consumers in a sustainable direction (Golan and others 2001). Box 2 illustrates the effective implementation of labeling.

Environmental certification programs assess the overall environmental policy and management of a company. Such programs give information on the environmental impacts of a company’s processing and production methods, for instance, resource use, production techniques, and emissions. Unlike environmental labels, which give information on the impacts associated with a particular product, environmental certification programs give

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**Box 2. Effective Implementation of Labeling**

In the early 1990s, environmental labels became non-tariff barriers to certain products in China such as silk, which, due to the lack of an environmental label, failed to get an import quota in France. In addition, export to some European countries of refrigerators dropped 60% because they lacked an environmental label (and the refrigerators contained chlorofluorocarbons). In 1993, the State Environmental Protection Administration (SEPA) announced the establishment of an environmental labeling program. Because an important objective was to promote Chinese exports, the certifying organization CCELP selected silk cloth and refrigerators to be among the first seven types of products that could display environmental labels. In order for exports to benefit from such labels, the labeling requirements had to be consistent with those of other countries. CCELP referred to Canadian labeling requirements when it formulated criteria for water-based paints, and it considered German criteria when it developed criteria for silk cloth.

*Source: Zhao and Xia 1999.*

Most environmental labeling programs are developed nationally. Consequently, they address national preferences relating to environmental quality. Promotion of environmental labels by governments should demonstrate the priorities of a country. For example, countries with high per capita energy consumption could introduce mandatory energy labels on household appliances, cars, and buildings.
information on the impacts of a company’s entire activity.

In principle, an environmental certification approach can be applied to any business enterprise, public administration, or government department. Currently there are two internationally accepted and third party certified generic environmental certification schemes: the International Standards Organization (ISO) 14.001 Environmental Management System (EMS; see ISO 2004) standard and the Eco-Management and Auditing Scheme (EMAS). These generic schemes provide overarching comparisons between industries and outline fundamental environmental codes for industry. Additionally, there are sector-specific environmental certification schemes that can provide more specialized and detailed guidance to companies within the same industry. This approach gives greater assurance that a certified company is managing its environmental impacts responsibly. See Guidance Note on Environmental Management Systems in Multinationals, Private Sector, and SMEs part for more information.

Similar to mandatory environmental labeling, environmental certification can also address a particular issue within a specific target group or industry. Public certification schemes are devised by a public authority or international agency that develops voluntary codes, guidelines, and standards. Companies are subsequently invited to comply with those criteria. An example is the Better Environmental Sustainability Targets (BEST) certification program, which provides recognition for lead battery manufacturers that meet minimum emission standards and agree to take back used batteries for environmental recycling.

Environmental certification may be encouraged by governments for industries that are difficult to regulate due to complex processes and regulations, or have an irregular or bad compliance history, or that pose a particular threat to environment and health. Furthermore, environmental certification, especially when certified by an accredited internationally recognized third party, can modernize industries by improving the way they manage risks, whether those are related to quality, environment, and/or health.

**Labeling and certification process** Environmental certification is considered a unilateral commitment to improving environmental performance. The company independently determines when and how goals will be reached. For the implementation of environmental certification programs, government may provide incentives (or implement sanctions) and promote the diffusion of environmental certification into companies. Companies frequently visited by regulators and companies with an irregular compliance history are more likely to adopt environmental certification programs. Companies that are not regularly visited, or that are at either end of the compliance continuum (that is, not in compliance, or in full compliance) are the least likely to adopt environmental certification schemes (Potoski and Prakash 2005).
For implementing an environmental label, the responsible government agency (or other establishing body) has to consider several steps (see table 1).

### Table 1. Steps for the Labeling and Certification Process

<table>
<thead>
<tr>
<th>Phases</th>
<th>Steps</th>
<th>Issues to consider</th>
</tr>
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<tbody>
<tr>
<td><strong>Preparation &amp; Launching Phase</strong></td>
<td>Assignment of responsibilities</td>
<td>Clear assignment of who is responsible for defining criteria, certifying products, and generally administering the program</td>
</tr>
<tr>
<td></td>
<td>Selection and determination of product categories</td>
<td>Selection of product categories and determination of certification criteria for these categories. Gathering of proposals for certification criteria and categories from industry, science, trade, consumers, environmental, and other public organizations (stakeholder process)</td>
</tr>
<tr>
<td><strong>Negotiation Phase</strong></td>
<td>Development of criteria, standards, or guidelines</td>
<td>Once product categories are selected, the next step is the establishment of requirements that an applicant must meet to be approved by the eco-labeling program. For example, if a labeling program is developed to overcome trade barriers, then the country’s labeling requirements should be consistent with labeling requirements in other countries. Criteria for granting an eco-label to a product or service can be limited, or without limits, as to the number of products that will qualify for the label. The group responsible for setting the criteria may include scientific and technical experts from both government and the private sector. Feedback and comments from interested stakeholders should be included before finalizing the list of criteria. This list should be periodically reassessed.</td>
</tr>
<tr>
<td><strong>Implementation Phase</strong></td>
<td>Certification and licensing</td>
<td>Producers, service providers, suppliers, retailers, distributors, importers, and legitimated institutions may apply for certification. The awarding process includes testing and compliance verification, applicant licensing, and monitoring (with periodic reexamination every 2 to 5 years). Applicants usually have to pay an application fee, the cost of verification, and an annual fee for use of the eco-label; these fees depend on annual product turnover.</td>
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**Role of government.** In the last 10 years, the implementation of environmental labeling and certification has seen a rapid rise worldwide. This growth has made both tools attractive for governments to promote similar programs in their country in order to comply with their own commitment to develop an environmentally sustainable society (GEN 2007; ISO 2010).

The potential role of the national government in establishing environmental labeling programs has
multiple facets. Government organizations can be involved in the selection of product categories, definition of certification criteria, certification of products, and administration of the program. In some countries, as is the case for China and Japan, the government provides all technical research and administrative support. However, in other countries, such as Germany and Austria, government officials and certification authorities share these duties. In Austria a consumer organization and a private certification authority are in charge of the labeling program.

Prerequisite Factors for Labeling and Certification

Establishing environmental labeling and promoting environmental certification programs require a clear understanding of the environmental (and non-environmental) concerns that the tool will focus on. In order to establish such an understanding, it is necessary to involve relevant stakeholders in a consultation process. Stakeholders should be industry experts, the scientific and engineering community, consumer organizations and other NGOs, retailers, and private organizations (for example, certifying organizations). Involving a wide range of stakeholders through all steps of program development and implementation brings about societal support for the program.

Governments should insure transparency throughout the program’s development and operation. Although governments can choose to award certification themselves, credibility increases significantly when it is awarded after successful independent third-party certification without conflict of interest (GEN 2004). Other government roles can be in developing programs to lower the entry barriers by, for example, supporting small and medium-size enterprises (SMEs) in the certification process. National governments can facilitate the development of a third-party certifying body and consulting companies that will reduce the costs for companies. Government should stimulate private sector support, because industry and commercial awareness, interest, and direct involvement are essential to program success (see box 3).
Advantages and Limitations of Labeling and Certification

Most national environmental labeling programs are new, and efforts made to measure their effectiveness are incomplete. Additionally, it is difficult to separate the impact of environmental labeling from other economic, environmental, and social policies. Therefore, few programs have claimed direct environmental benefits from environmental labeling. Nonetheless, positive responses from industry and consumers suggest that such labels are perceived as good marketing tools and generally accepted symbols of environmentally sound choices. Other success indicators of an environmental labeling program are increased numbers of certified products and increased industry involvement in the selection and development of category criteria. Strengths and weaknesses of this tool are shown in Table 2.

Table 2. Strengths and Weaknesses of Labeling and Certification

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>Stakeholder participation</td>
<td>Many different labels</td>
</tr>
<tr>
<td>Negotiating detailed award criteria takes places between public and private experts and a number of other stakeholders.</td>
<td>Increased number of environmental product labels with different guiding standards can lead to consumer confusion.</td>
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(continued)
## Strengths

**Reward leadership**
Eco-labeling programs reward environmentally ambitious companies with public recognition, thus encouraging companies to take a pro-active approach towards the environment.

**Increased environmental awareness**
Through their public visibility, eco-labels are likely to raise awareness among consumers about environmental issues.

**Diffusion of best available techniques**
Ambitious eco-labels can help to make the best available techniques clearly recognizable and widely applied.

**Provision of economic incentives**
For manufacturers, labels provide benchmarking information and information on the marketplace, help to green the corporate image, and serve as a communication tool.

**Provide greater flexibility than regulations**
Environmental certification can offer more ambitious goals than compliance with regulations, while lowering administrative costs and enabling faster implementation.

**Encourage proactive and precautionary attitudes in industry**
Environmental certification can shift businesses’ mindsets from reactionary to proactive, cleaner production.

**Improve dialogue and trust between industry and government**
Implementing environmental certification programs will improve industry compliance and build relationships that are more cooperative.

**Demand-driven policy instrument**
As consumers have the ultimate voice through purchasing decisions, eco-label criteria are likely to reflect consumers’ preferences and concerns.

**Can improve trade**
Environmental certification programs, when third party certified, can be seen as a commitment by the company to improve environmental performance, reduce risks, and comply with customer requirements.

## Weaknesses

**Potential trade effects**
Eco-labels can raise trade concerns when criteria include ones that discriminate against imported products. Transparency in development of criteria and consultation with importers is critical to avoid potential barriers.

**No continuous innovation incentive**
When criteria are not continuously evaluated and updated, no incentive exists for companies to improve performance beyond the specifications of the current criteria.

**Effectiveness is difficult to assess**
Efforts to measure effectiveness are incomplete, for example, there are difficulties in assessing the impact of eco-labels on the overall performance of companies.

**Not always clear preferences**
Labels mainly address domestic economic and environmental priorities; therefore, selected criteria may not be relevant to broader environmental and social issues.

**Difficult to apply in areas with little business self-interest**
Environmental certifications are limited to areas where industries have financial motivation to change their behavior.

**Criteria depend on public perception**
Environmental issues mirrored by the criteria might be more reflective of the public’s sometimes irrational concerns, rather than reflective of sound scientific evaluations.

**Size matters**
Environmental certification programs focus on management structure, and the required changes may not be compatible with the management styles of small and medium enterprises.

**Environment impacts may not be the driving force**
When market demand, instead of environmental impacts, is the driving force, going beyond compliance and continuous improvement may not be wholeheartedly pursued.

**Sources:** GEN 2004; Gerstenfeld and Roberts 2000; OECD 2003; and UNEP DTIE 1998.
In some cases, costs hamper the implementation of environmental certification because a company is too small to afford the certification process (Khan 2008). See box 4.

### Box 4. Example of Certification Costs

Costs for obtaining an eco-label certificate differ by country. In China, the total fee for obtaining an eco-label certificate ranges from US$ 1,800 to US$ 6,000 (Zhao and Xia 1999). In the Netherlands, acquiring an eco-label certificate has two cost components: a one-time certification fee of US$ 800 and an annual fee between US$ 600 and US$ 39,000 (2008 figures; SMK web site). The EU charges an application fee of 200 to 1,200 euros and an annual fee of 1,500 euros (EU web site).

### Interaction with other Tools and Possible Substitutes

Labeling and certification work in conjunction with a number of other policy tools. These include audit programs; environmental information disclosure (EID); environmental management systems (EMS); environmental licensing; life cycle analysis (LCA); regulations and standards, monitoring, inspection, compliance, and enforcement programs; and voluntary agreements. For more information, see World Bank Guidance Note series on tools for pollution management, including the reports on EID, EMS, environmental licensing, LCA, regulations and standards, and the other guidance notes in this series.

### Practical Examples of Labeling and Certification, and Lessons Learned

**Ecomark** In 1991, the government of India launched the eco-labeling scheme known as Ecomark for easy identification of environment friendly products. Any product made, used, or disposed of in a way that significantly reduces the harm it would otherwise cause the environment could be considered an environment friendly product. The criteria follow a “cradle to grave” approach, meaning that the entire production process is evaluated, from raw material extraction to disposal. The Ecomark label is awarded to consumer goods that meet the specified environmental criteria and the quality requirements of Indian standards. The program has become mandatory for certain products including refrigerators, air conditioners, distribution transformers, and fluorescent lamps. Ecomark labeling is scheduled to become mandatory for color televisions, liquid propane gas stoves, and electric motors.

**Eco-Watch.** In the Philippines, the local environment agency designed a rating or labeling program called Eco-Watch to rate firms and label them with one of five colors according to their environmental performance. Black indicates the least compliant, followed by red, blue, green, and ending with gold, which represents the best practices. In the first evaluation, 92% (48 out of 52) of the companies involved in the program were found to be non-compliant, and given either “Black” or “Red” ratings. The program led to improved environmental
performance, and the number of compliant companies with “Blue” ratings increased from 8% to 58% within 18 months.

**Energy Star.** Energy Star is a voluntary labeling program operated jointly by the United States Department of Energy (US DOE) and the United States Environmental Protection Agency (US EPA) in an attempt to reduce energy consumption and greenhouse gas emissions by power plants. The US DOE and the US EPA enter into partnerships with manufacturers and key stakeholders to promote products that meet energy efficiency and performance criteria established by the agencies. The program was intended to be part of a series of voluntary programs, such as Green Lights and the Methane Program, to demonstrate the potential for profitable reduction of greenhouse gases and facilitate further steps to reduce global warming gases.

Initiated as a voluntary labeling program designed to allow consumers to identify and purchase energy efficient products, Energy Star began with labels for computer products. In 1995, the program was significantly expanded, introducing labels for residential heating and cooling systems and new homes. As of 2006, more than 40,000 Energy Star products were available in a wide range of items including major appliances, office equipment, lighting, and home electronics. In addition, the label can be found on new homes, and on commercial and industrial buildings. In 2009, nearly 21 percent of new housing in the United States was labeled Energy Star (US EPA and US DOE 2010).

It has been estimated that the US Energy Star program will save approximately US$ 90 billion (a billion is 1,000 million) during the 2007–2015 period (Sanchez and others 2008). The Energy Star program has helped spread the use of LED (light-emitting diode) traffic lights, efficient fluorescent lighting, power management systems for office equipment, and low use of standby energy.

**GreenLabel.** Singapore’s GreenLabel program was launched in May 1992 by the Ministry of the Environment as part of the country’s national environmental plan. GreenLabel is a voluntary ISO Type I program open to local and foreign companies. This program covers a broad range of products, as well as services and processes, but not food, drinks, or pharmaceuticals. More than 700 products have the GreenLabel, involving over 130 manufacturers (SEC web site).

**Green Rating Project.** In India, a public disclosure program, the Green Rating Project, was established by the Centre for Science and Environment, an environmental NGO. Apart from the Project Advisory Panel, there was a three member technical panel from the pulp and paper sector formed to help develop the rating process. The results of the project showed that among 31 large pulp and paper factories, the adoption of a formal environmental policy increased from 30% to 89%, the establishment of an environmental department increased from 18% to 89%, and certification of the EMS according to ISO 14001 increased from 3% to 46%. This program has been
extended to the chloralkali and the automobile industries (Kathuria 2009; Sterner 2003).

References and Resources on Labeling and Certification


EU. http://ec.europa.eu/environment/ecolabel/.


SMK. “Kompas voor duurzaam ondernemen (Compass for Sustainable Business).” SMK. http://www.smk.nl/ (in Dutch).


Environmental Information Disclosure*

Introduction

Governments throughout the world seek to attain sustainable development environmentally and socially. The link between sustainable development and access to environmental information is established in principle 10 of the Rio Declaration (a soft law instrument), which reinforces the principle of public access to environmental information in achieving sustainable development. Principle 10 of the Rio Declaration on Environment and Development, which was adopted at the United Nations Conference on Environment and Development in June 1992, states:

- Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided. (UN DESA 1992)

The principle of public access to environmental information is also reinforced by the Aarhus Convention and by national legislation in dozens of countries as necessary for sustainable development.

Environmental information generally refers to data held by public authorities that is generated by environmental legislation and measures at all levels of government. An example is information on the state of water, air, soil, fauna, flora, land, and natural sites, and data on activities that are likely to affect these resources adversely or on measures designed to protect these, including administrative measures and

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* This guidance note was prepared by Hua Wang (Senior Environmental Economist, DECEE). Peer reviewers included Maged Hamed (Senior Environmental Specialist, MNSEN) and Tijen Arin (Senior Environmental Economist, ECSSD). Additional comments and contributions were provided by Dan Biller (Lead Economist, SASSD) and Suiko Yoshijima (Consultant, MNSEN). Editorial assistance was provided by Stan Wanat (Consultant), Juliette Guantai (Program Assistant) and James Cantrell (Communication Analyst). The task team leaders for this product are Kulsum Ahmed (Lead Environment Specialist, ENV) and Helena Naber (Environmental Economist, ENV). The product was prepared under the guidance of the following World Bank Group management: James Warren Evans / Mary Barton-Dock (Directors, Environment Department, World Bank), Bilal Rahill (Senior Manager, IFC), and Frank Lysy / Ravi Vish (Director, MIGA).

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1 The Aarhus Convention is the United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters. It requires its 44 parties to guarantee rights of access to information, public participation in decision making, and access to justice in environmental matters. The Convention states that any person, regardless of nationality or place of residence, can ask for environmental information held by public authorities. The person requesting the information does not need to state a reason. The authorities are required to help people with requests, for instance by making practical arrangements for obtaining information or by passing a request to another authority if the first authority approached does not hold it. The Aarhus Convention is the first and so far only legally binding multilateral environmental agreement to explicitly implement Principle 10 of the Rio Declaration; and, is a regional environmental treaty that has been ratified by almost all European countries and the European Union.
Environmental management programs. Environmental information also includes data held by private entities, such as companies. A great deal of environmental information is being generated and collected as a result of environmental law and regulations or in connection with applications for governmental licenses. Most of the environment-related information is generated for purposes of environmental monitoring and control or government oversight. Research activities may also have generated or collected some environmental information.

Providing rights to the public for accessing environmental information can empower the public to make effective and efficient decisions relating to environmental issues. This may include personal decisions about purchases.

The disclosure approach involves releasing information on a polluter’s environmental performance, including emissions to air, wastewater discharges, waste, and compliance with standards in a manner that is clear to a large and varied audience. The underlying assumption behind public disclosure is that that industrial facilities (or a subset of them) may be sensitive about their reputation in the market place or in the communities where they are located, and will thus avoid this reputation from being tarnished, or will seek this reputation being enhanced in the public arena, in other words social and/or market pressure can generate strong incentives for pollution control, in a way that traditional enforcement tools or market-based approaches may not be able to achieve (Dasgupta and others 2007). Environmental regulators may make beneficial use of the situation by publicly releasing appropriate information pertaining to the firm’s environmental performance.

The public’s right to know environmental information as well as the need to incentivize sources of pollution to minimize contamination has led many countries to develop and implement environmental information disclosure (EID) programs. This Guidance Note is meant for national governments who are considering whether to implement an EID program. The Note identifies key points to consider when developing an EID program while keeping system costs as low as is practical.

**Description and Application of Environmental Information Disclosure**

An EID program can be a simple environmental information system (EIS) that collects and publicly releases important environmental data in one or more of the following ways:

1) An environmental catalogue or register of potentially harmful pollutant releases (this system is called Pollutant Release and Transfer Register, or PRTR). Modeled from the successful United States PRTR program and strong pressure from the United Nations’ Rio Protocol,

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2 Moreover, some consider that environmental information includes all information relevant to decision-making that concerns the environment: thus financial, social, economic data can also be environmental information.
international organizations began assisting countries in PRTR development.

2) A disclosure of environmental performance ratings based on a set of pollution control indicators and a performance rating methodology (such a system is called an Environmental Performance Rating and Disclosure, or EPRD). Countries such as China, Indonesia, Philippines, and Ukraine have successfully established EPRD programs.

Additionally, the public can request for certain information that a government agency may have.

Research has shown that EID programs can help citizens make more efficient decisions related to environmental quality and can generate strong impacts on polluters (Jin and others 2010). Significant pollution reduction can be achieved with no further regulatory efforts, because environmental information disclosure can affect a polluter’s relationship with various stakeholders in markets and communities.

1) Preliminary Objectives. The first step in establishing an EID program is for the government to determine preliminary objectives for its EID. These preliminary objectives become the basis for initial discussion with interested parties such as industry, local government, citizen groups, and government-owned or operated installations. Unless these "stakeholders" reach agreement on the scope, objectives, and details of management, successfully implementing an EID is likely to be difficult. Decisions may be needed on the following specific issues in establishing an EID for pollution control:

1) The list of pollutants and other data to be reported upon;
2) Who must report and how often;
3) To whom the data shall be reported;
4) How claims of confidentiality will be handled;
5) How the performance would be rated if an EPRD approach is chosen;
6) How the data will be provided to the public;
7) Whether the EID will be mandatory in nature and if so, how its requirements will be enforced;
8) How the EID will be implemented administratively and by whom, e.g. guidance issued to polluters, inspection capabilities, data reception and analysis; what financial and human resources will be needed to implement EID, especially in its early stages.

Establishment and Implementation. Major principles concerning establishment and implementation of an EID system include:

1) Reducing duplicative reporting and cost, EID systems should start from the existing information system;
2) EID systems should undergo evaluations and have the flexibility to be altered by the government in response to these evaluations or to the changing needs of affected and interested parties;
3) Handling data and managing capabilities of the system should allow for verification of data entries and outputs;

4) Establishing the EID system, its implementation, and operation should be transparent and objective.

EID effectively provides incentives for local governments and for firms to protect the environment further and to empower the public and individual citizens alike to make better decisions when the environment is a concern. EID is easy to design and operate, with relatively low regulatory cost.

Prerequisite Factors for Environmental Information Disclosure

Many countries that stipulate, as a general rule, broad access and dissemination of environmental information also have in place a list of exceptions to protect other relevant interests and values, such as privacy or confidential commercial information. In its inception phase, due regard should be paid to the existing legal framework, to determine whether or not it is legal to disclose publicly the environmental information of the targeted facilities. Agencies interested in establishing an EID program need to determine whether any provision of law (such as the constitution, environmental protection, or rights-to-information legislation) legally justifies public disclosure of environmental information and whether the targeted facilities could argue in court that the public disclosure would violate privacy laws. An EID program should become an explicit and legally recognized instrument that environmental regulators may or must use for pollution control, and the program should become an explicit feature of the legal and institutional framework.

Monitoring facilities are necessary for an effective EID program. These facilities can require significant financial resources. This is especially the case during inception. It is also the case when insufficient information is available about pollution from emissions.

Where no sufficient legal provisions are available for EID, governments may still be able to establish and operate public disclosure programs. An example would be a voluntary disclosure program, where firms may submit their environmental information to government agencies voluntarily and government agencies make that information publicly available. In the long run, the governments should mandate public disclosure.

Effective application of the principle of public access to environmental information requires that any natural or legal person should have affordable, effective, and timely access to environmental information held by public authorities upon reasonable request, without having to prove a legal or other interest. Governments need to ensure that their competent public authorities regularly collect and update relevant environmental information, including information on environmental performance and compliance by operators of activities potentially affecting the environment. To that end, governments should establish relevant systems to ensure an adequate flow of information about proposed and
existing activities that may significantly affect the environment. They should periodically prepare and disseminate at reasonable intervals up-to-date information on the state of the environment, including information on its quality and on pressures on the environment. In the event of an imminent threat of harm to human health or the environment, governments should ensure that all information that would enable the public to take measures to prevent such harm is disseminated immediately. Governments should encourage and provide means for effective capacity building, both among public authorities and among the public, to facilitate effective access to environmental information.

Advantages and Limitations of Environmental Information Disclosure

An EID can help achieve pollution prevention and control with relatively lower regulatory costs as long as certain environmental information is available. A public disclosure program can serve as a major driving force for pollution reduction throughout many sectors of the economy. Disclosure can lead to a competition among polluters to reduce pollution emissions. With a disclosure system in place, local or regional governments can better assess the status of local environments and can use the results as one input for assessing risks to human health and the environment. Citizens can better decide on certain environmental issues and mitigate potential environmental risks. However, legal, political, or financial barriers may exist, especially at its inception stage; disclosure of inaccurate information or unfair treatment of firm’s performance information may draw setbacks.

An EID program can be a complement to traditional command-and-control regulations and market-based instruments. It can help enforce those traditional regulations in place. An EID program, however, can be an independent program without interacting with other environmental policy programs. The necessary condition for an EID program to work is the availability of environmental information that is accessible to the public. The cost of establishing and maintaining an EID program varies and is determined by various factors including program scale, program methodology, data availability, and means of data collection and disclosure, etc. However, once the necessary data is available, the operation cost of an EID program is very low, comparing to other regulatory approaches. Funding for establishing such a program can also be low if only using existing data.

Legal and political barriers may exist to prevent governments of certain countries from adopting public disclosure strategies for environmental management; bad environmental performers may always try to block the use of public disclosure strategies. Data availability can be another constraint, especially when environmental monitoring facilities are not in place, in which case substantial financial resource is necessary for establishing and maintaining a public disclosure program. EPRD programs are mostly found in the developing world so far, while PRTR programs are found mostly in the developed countries. In a developed country, compliance to environmental regulations is less of a problem. While
accurate emissions information can be readily available and environmental NGOs can be very active in judging relative environmental performance, a PRTR program may be more appropriate. However, in a less developed country, the government may have more difficulty in collecting and releasing detailed firm-level pollution emission information and therefore an EPRD program could be more feasible and effective.

Interactions with Other Tools and Possible Substitutes

Providing public access to firm-level environmental information can also be a cost-effective regulatory tool for pollution control. Traditionally, environmental regulators have applied the ‘command-and-control’ approaches to regulate pollution discharges from industries. Under this approach, industrial facilities are required to limit their pollution discharges to amounts within regulatory standards. As a complement to command-and-control regulations, market-based approaches aim to generate incentives for pollution control by introducing or creating a price for pollution discharges. However, an effective implementation of the command-and-control approaches and/or the market-based instruments has thus far proved challenging for environmental regulators, especially in the developing countries, who usually have limited institutional capacity and resources. Information disclosure strategies have recently emerged as an alternative or a complementary approach to create incentives for pollution control. They are rapidly gaining ground throughout the world, including in developing economies.

Practical Examples of Environmental Information Disclosure and Lessons Learned

Canada. In autumn 1991, Environment Canada initiated design of a PRTR program, National Pollutant Release Inventory (PRI). Stakeholders from industry, environmental organizations, labor organizations, provincial government agencies, and national government formed a committee to develop the basis for this disclosure program. The Committee set up work groups to study the scope, list of chemicals to be included, sources, and reporting thresholds. In 1992, the Committee held a number of information and consultation sessions throughout Canada to obtain additional views. The Committee achieved consensus that anyone owning a facility in Canada that manufactures, processes, or otherwise uses any substance on the Canadian PRI list in quantities of 10 tons or more per year, and that employs 10 or more employees per year, be required by law to report releases/transfers to the Minister of Environment. The Committee agreed on a list of 176 substances as the initial items to be reported. These were drawn from the list in the United States Toxic Release Inventory but omitted all items not in Canadian commerce. The Committee agreed that data be collected electronically on a computerized reporting form; however, a paper version is available for those lacking computer access. The Committee agreed that data be electronically accessible from any part of Canada and that the PRI present geographic...
data about releases/transfers. The Committee completed its work in December 1992. More than 300 substances have been listed in Canada's PRI, and more than 8000 facilities report pollution release and transfer data to the program (Environment Canada Web site).

**Philippines.** In another case, the Department of Environment and Natural Resources (DENR) of the Republic of the Philippines implemented in 1998 an EPRD program named the Industrial EcoWatch System. EcoWatch was introduced by DENR in 2003. The adoption was based on the Bill of Rights of the 1987 Philippine Constitution, which refers to the Right of Access to Information. A group of stakeholders known as the Program Monitoring Group (PMG) oversees the implementation of the Industrial EcoWatch System. The PMG consists of representatives of local government units Laguna Lake Development Authority (LLDA), the Environmental Management Bureau of the DENR, the private sector representatives, and an NGO representative. LLDA has been particularly active implementing its own EcoWatch System. This authority has rated and recently disclosed the names of more than 700 enterprises in 2008. In 2008, DENR announced expansion of its Industrial EcoWatch System to include compliance ratings on air pollution in addition to water pollution, which had been the sole focus of EcoWatch since its inception in 1998. Industries’ performance is rated using five colors – black, red, blue, green, silver and gold, from worst to best. The performance indicators include pollution emission relative to emission standards, compliance with government procedure requirements, public complaints, clean technology, and the presence of environmental management system and a pollution treatment system.

**References and Resources on Environmental Information Disclosure**


Setting Priorities: Defining a Strategy within a Broader Framework*

Introduction

Government agencies have finite human and financial resources to dedicate to the achievement of growth and development, poverty reduction, and environmental sustainability goals. For this reason, it is important to ensure that scarce public resources are dedicated to the different priorities in a cost-effective manner that maximizes their use benefit. Therefore, determination of priorities should ideally follow an approach that emphasizes both participation and analysis; optimizes budget allocations; demonstrates the need for cost effectiveness and cost efficiency; addresses risk and political issues; and shows the need to address poverty and growth in a sustainable manner. This Guidance Note focuses on setting priorities as a tool that is available to government stakeholders for effective pollution management.

How is pollution management relevant to setting priorities?

Setting priorities links to pollution from two perspectives: on one hand, pollution results from the path taken by countries to achieve growth and development, and different paths may result in different types and levels of pollution. On the other hand, pollution is one of the environmental issues that face countries (alongside biodiversity conservation, land degradation, climate change, water, and other issues) and impacts countries’ development and poverty reduction. For this reason, addressing pollution is an environmental priority that links to the choices a country makes to address poverty reduction, economic growth, and development priorities.

Who sets pollution management priorities?

Pollution results from activities undertaken in socioeconomic and development sectors, for example, from economic activities such as mining, industry, tourism, construction, and transport). For this reason, pollution management is relevant not only to environmental ministries and agencies, but also to agencies responsible for setting policies in productive and economic sectors. These include ministries responsible for transport, mining, energy, industry, and trade, as well as ministries of economy, planning, or finance responsible for setting a country’s broader...
economic development and poverty reduction policies.

Responsibilities for setting priorities that impact pollution management are often divided among several government and public agencies (with an agency leading the process), which often have their own sets of priorities. This diffusion of responsibilities is one of the main challenges that face the priority-setting process. Different agencies set the priorities that influence pollution management, whether that relates to how pollution is generated, to changing the pollution profile, or to reducing pollution. Furthermore, these agencies use different processes to set priorities. Three distinct profiles may be distinguished in this regard:

1) **Environment sector.** by agencies responsible for the environment-sector portfolio such as ministries of environment at the national levels (and at regional levels where applicable). The role of the environment ministries is integral in identifying environment issues and relevant interventions, including setting priorities for addressing pollution issues. Pollution is often the result of activities that are considered the domain of other agencies (for example, economic and development activities). Furthermore, many environmental agencies worldwide face institutional and capacity constraints (for example, financial resources, staffing, and equipment). Consequently, it becomes necessary for the environment agency to also champion pollution-management-related priorities and to promote inter-agency collaboration and wider stakeholder involvement in achieving pollution management priorities. Environment agencies set priorities through processes such as the national environmental action plans, and environment sector strategies.

2) **Productive sector.** by productive sector agencies/ministries such as ministries of industry, mining, transport, and trade. These agencies set priorities in their respective sectors, which in turn influence pollution type and quantity. For example, the ministry of transport could set a priority of increasing the reliance on public transport or shifting from road freight to railroad. This, in turn, would influence the amount, type, and location of transport-related air emissions. While productive sectors’ policies influence pollution management, pollution management itself is often not a priority for these agencies, and it is important that the pollution agenda advocated by the environmental ministry does not hold back the productive sector agencies. Productive sector agencies set their priorities through their own sector strategies and action plans. Pollution management and environmental priorities could be mainstreamed through the application of strategic environmental assessment.

3) **Social protection, planning, and development sectors.** by ministries of planning, finance, and/or economic development. Poverty reduction and economic development priorities set at the national levels by these agencies in national development planning processes, as well
as in poverty reduction strategy and plans (PRSPs), influence the pollution management agenda. Priority setting processes relating to PRSPs need to consider implications for the pollution management agenda, as well as the impact of pollution on development and poverty reduction objectives.

The priorities that are set differ in their geographic coverage; that is, priorities could be set at national, sub-national, and local levels, and could feed into each other in a bottom-up or top-down approach. Furthermore, priorities differ in their sectoral coverage (environment sector and productive sectors), and in their timescale (short-term, medium-term, and long-term priorities). Priorities for pollution management are set at the three levels described above in their relevant processes. A number of tools could be used within these processes to ensure that priorities are identified using a scientific approach and a sound economic basis. Some of these tools are more often used to identify issues, while others are more often used to identify interventions. The section below provides an overview of processes that government stakeholders use to set priorities at different levels, as well as the tools that could be used within these processes to prioritize pollution management issues and interventions.

Description and Application of Setting Priorities

Priorities for the various levels described above (environment sector, productive sectors, and national development policy levels) rely on different processes (for example, national environmental action plans) to set environmental priorities. Furthermore, priorities for the various levels above use different processes (for example, strategic environmental assessment and country environmental analysis) to identify and mainstream environmental priorities into national and sectoral growth and development priorities. A number of economic and scientific tools could be used within these processes to ensure a scientific and methodologically-sound approach to setting priorities. These processes and tools are described below.

Processes for setting priorities

Agencies rely on a variety of processes in which they set their national/regional pollution management priorities. Some of the common processes are described below. In many countries, a combination of these specific processes is used.

- National Development Plan and Poverty Reduction Strategy and Plan (PRSP). Ministries of finance, economic development, and/or planning often lead the preparation of national development plans and strategies. PRSPs were introduced in 1999 by the World Bank and the IMF to enhance domestic accountability for poverty reduction reform efforts, and to enhance the coordination of development assistance between governments and development partners. PSRPs were a precondition for access to debt relief and concessional financing from both institutions' HIPC Initiative (World Bank 2010). PRSPs build upon existing strategies and plans wherever possible, both at the sectoral and the national level. Existing national strategies or
development plans that are consistent with the PRSP approach’s guiding principles may well be considered to be the PRSP.

- **Country Environmental Analysis/profile (CEA).** Multilateral development banks rely on CEA to integrate environmental considerations into country assistance strategies, poverty reduction strategy papers, and development policy lending by linking national environmental priorities to priorities for sustainable growth and poverty reduction. CEA consists of three broad components (building blocks): i) Identification of environment priorities linked with growth and development through a range of quantitative and/or economic tools such as analysis of the costs of environmental degradation, net savings analysis, distributional analysis, and surveys; ii) Assessment of environmental policies and institutions; and iii) Analysis of environmental priorities and themes. The CEA preparation process relies on the participation of the ministries of environment, and their results could be incorporated into the work of planning and finance ministries in their national development plans and PRSPs.

- **Strategic Environmental Assessment (SEA).** SEA is a process in sectoral planning that could be used by sectoral ministries/agencies and is also used by development agencies. SEA provides a platform of dialogue to consider the environmental implications of interventions along with mechanisms to reach agreements on priorities and proposed actions. Analytical work is intertwined with public participation in policy-SEA. Analytical work could be summarized in five steps: i) Identification of environmental priorities will provide an account of existing key environmental issues in the sector or region to be affected by the policy. Their interrelationship with economic and social priority issues (that is, existing private sector projects and the standards to which they operate) should also be discussed to clarify how environmental priorities are linked to growth and poverty alleviation; ii) Stakeholder analysis; iii) Assessment of institutional and capacity gaps; iv) Policy recommendations, institutional strengthening, and capacity building recommendations; and v) Political economy risk. For details about SEA, please see the SEA Guidance Note.

- **National Environmental Action Plans (NEAP).** prepared mostly by environmental ministries or agencies, the NEAP was introduced following a call during the 1992 Rio Earth Summit to prepare national environmental action plans to accelerate environmentally sound and sustainable development. World Bank operational policy (World Bank OP 4.02) envisages NEAPs as living documents that contribute to overall national development policy and decision making, and are intended to be demand-driven, participatory, and result in a time-bound plan of action to help countries integrate environmental concerns in their overall development strategies. In response, many countries developed their national environmental action plans (NEAP), which often were the turning point in addressing the challenges of managing both the environment and development. However, in most cases NEAPs were not used as instruments for priority setting based on sound cost-benefit analyses. Often, they did not take the political economy into consideration and thus failed to
demonstrate the economic importance of the environment sector or mainstreaming the environment into the productive sectors of the economy (Croitoru and Sarraf 2010). For this reason, it is important that in the preparation of NEAP, economic tools are used that would demonstrate the economic importance of the environment sector. Such tools include cost-benefit analysis and economic valuation, which would give a common denominator for the different environmental priorities (such as biodiversity, solid waste, air pollution, and depletion of water resources) and help with the prioritization of issues and interventions.

Choice of process for setting priorities.

The choice of processes for setting priorities often depends on level of planning, objective of the process, and the sectoral and geographic scale of planning. It also depends on contextual factors, such as the stage in the planning cycle; the need for planning at different levels; and by the legal and institutional framework and organizational responsibilities determined by law in a country.

Tools for Setting Priorities.

A number of tools may be used within the context of national/sectoral planning (either stand-alone or as part of SEA or CEA) such as use of economic tools and indicators (COED, CBA, macroeconomic indicators); decision support tools (such as multi-criteria analysis, risk assessment, and comparative risk analyses); and statistical tools (for example, distributional analysis and surveys). Moreover, there are tools that are better suited for prioritizing issues (such as ecosystem valuation and cost of environmental degradation), while others are better suited for prioritizing interventions (for example, cost-benefit analysis and multi-criteria analysis). Moreover, different tools can be used as part of different processes. For example, economic tools could be incorporated in the preparation of national environmental action plan and as part of national development planning, or CEA. Moreover, a number of tools (such as combining the cost of environmental degradation with surveys and distributional analysis in a CEA) could be used within the same process. Below is a brief description of examples of these processes and tools:

Tools that help in prioritizing issues.

- **Cost of environmental degradation (COED):** The objective of the COED is to estimate the annual cost of present and future impacts of environmental damage occurring in a given year. Estimates are stated as percentage of the country’s gross domestic product (GDP) for the year, making it relevant to both policy makers and the general population (Sarraf 2004). The COED usually measures the damage caused to several environmental categories such as water, air quality, agricultural land, forests, waste, and coastal zone. Spatially, the analysis can be done at the local level and national level. COED is useful for moving the environmental agenda into the realm of sectoral ministries other than the ministries of environment. Specifically, the COED could serve as an instrument to identify areas where environmental degradation imposes the largest costs to society; identify areas that most significantly undermine social and economic development.
processes; provide a basis for integrating environmental issues into the financial and economic evaluation of investment projects as well as in sector-wide and economy-wide policies and regulations; provide a monetary basis for allocation of scarce private and public resources toward environmental protection; and enhance the role of the ministries of the environment in demonstrating the importance of environmental protection, using the same language as finance and economy ministers (Croitoru and Sarraf 2010). It is possible to estimate the cost of environmental degradation by valuing impacts on health and quality of life and on natural resources (Bolt and others 2005). However, because health data are more easily available, COED have tended to estimate value health impacts more often. The damages to ecosystem services could also be included in COED studies alongside damages to health and quality of life.

- **Natural capital and ecosystem accounting.** Including the value of ecosystem services in national accounts would provide information to decision makers in planning /economy/ finance ministries regarding the importance of services that ecosystems provide. Pollution impacts the ability of ecosystems to provide services, thus impacting national accounts. For example, acid rain leads to degradation of forests, thus decreasing their ability to provide ecosystem services.

- **Macroeconomic indicators.** The use of macro-economic indicators in setting priorities helps mainstream environmental and pollution management considerations into a framework that is relevant to key economic ministries. In this regard, two relevant indicators are built on the idea that the generation of well-being depends on a country’s asset base, which includes natural resources as well as produced and human capital. A country’s capacity to sustain growth in well-being is closely linked to how its asset base varies over time. Wealth Estimates measure a country’s total wealth as composed of produced capital (infrastructure and urban land), natural capital (such as cropland, forests, fish stocks, and minerals) and human resources (human capital and quality of institutions). Adjusted Net Saving is an indicator of the sustainability of an economy. It measures changes in wealth from one year to the next by looking at increases in produced capital (through investments), depletion of natural resources (such as through the extraction of oil or timber from forests), investments in human capital (for example, through education), and damages to health caused by pollution.

- **Surveys and distributional analysis of environmental priorities.** Surveys and distributional analyses allow the priority setting agency to gauge the opinion of different groups of populations regarding what they consider as environmental priorities. This ensures that opinions of different groups are taken into consideration and most importantly ensures that voices of the poor are taken into consideration in setting environmental priorities.

- **Comparative Risk Assessment.** is a systematic way for looking at environmental problems that pose different types and degrees of health risk; the purpose of this kind of assessment is
to identify the most important health risks from the point of view of the people affected (World Bank 1998). A risk assessment for a toxic air pollutant combines results of studies on the health effects of various animal and human exposures to the pollutant with results of studies that estimate the level of people's exposures at different distances from the pollutant's source. While the estimates provided by these risk assessments are far from perfect, they help scientists evaluate the risks associated with emissions of toxic air pollutants. Using risk estimates and other factors, the government can set regulatory standards to reduce people's exposures to toxic air pollutants and reduce the risk of associated health problems. The risk assessment process consists of four steps: i) hazard identification; ii) dose-response assessment; iii) exposure assessment; and iv) risk characterization (EPA website 2010). Together with consideration of costs, technical feasibility, and other factors, the results of comparative risk assessment can be used to set priorities for environmental management (World Bank 1998).

Tools that help in prioritizing interventions

- **Cost-Benefit Analysis (CBA).** CBA takes the cost of environmental degradation one step further by comparing the monetary value of benefits with the monetary value of costs in order to evaluate and prioritize issues. The effect of time (that is, the time it takes for the benefits of a change to repay its costs) is taken into consideration by calculating a payback period. In its simple form, CBA uses only financial costs and financial benefits (for example, a simple CBA of a road scheme would measure the cost of building the road, and subtract this from the economic benefit of improving transport links). A more sophisticated CBA approach attempts to put a financial value on intangible costs and benefits. Data requirements for CBA could make it difficult to implement for a broad array of possible priorities. CBA is useful to identify interventions for the identified environmental priorities. CBA is a useful tool for prioritizing interventions for priority issues that have been identified.

- **Multi-Criteria Analysis (MCA).** is a technique to assess alternative options according to a variety of criteria having different units. MCA assigns weights and scores to options so both quantitative and qualitative criteria can be analyzed. MCA techniques have three common components: a given set of alternatives; a set of criteria for comparing the alternatives; and a method for ranking the alternatives.

Choice of tool(s) to use within the processes for setting priorities

The tool to use in setting priorities depends on the objective for using the tool – whether it is to better identify winners and losers in setting priorities; ensure that priorities important to different segments of society are taken into consideration; or provide a common economic denominator for comparing issues. In choosing a tool, it is important to note that tools could be used in complementary manner, and to be flexible in applying the different tools to ensure that their application is useful for the objective sought. Figure 1 identifies different tools.
Prerequisite Factors for Setting Priorities

- **Data requirements and environmental monitoring**: Most tools for setting priorities require a certain amount of information to function, and they differ in these informational requirements. Environmental monitoring is one important tool to provide information for objective assessment of the state of the environment. This monitoring in turn feeds data to tools such as those to calculate the cost of environmental degradation and other quantitative tools. See *Guidance Note on Environmental Regulation and Standards, Monitoring, Inspection, Compliance, and Enforcement as a Tool for Pollution Management*. While the importance of comprehensive and reliable data cannot be over-emphasized for the purposes of setting priorities, many techniques are available to compensate for the lack of data. An example is the use of appropriate models to estimate emissions from the industrial sector.
based on more readily available employment data rather than using actual emissions or output data that may not be available. Nevertheless, environmental monitoring and data availability in their combination are fundamental for any decision-making process, prioritizing, or environmental policy making.

- **Champion agency**: A champion agency with vision, authority (backed by a clear and strongly backed mandate from government and/or political forces), determination, and the proper means (staff and resources) is essential to setting priorities. Most countries have some form of environmental agency or environmental ministry, either stand-alone or in combination with another sector (such as tourism and environment, or forestry and environment). Usually, these agencies are expected to take the lead in setting environmental priorities.

- **Collaboration across a broad set of stakeholders**: The priority-setting process should recognize the need for working with a broad set of stakeholders both in the priority-setting process and in the implementation of priorities. This necessary collaboration includes inter-sectoral and inter-agency collaboration, and working with non-governmental sectors (the business community, civil society, and the general public) to identify and achieve priorities. Setting environmental priorities requires a collaborative approach to ensure that all ministries and agencies are on board and have ownership of the agreed-upon priorities. Moreover, a collaborative approach would ensure that priorities are determined not only within a sector but cross-sectorally as well.

- **Flexibility**: Various tools (or combinations of tools) can be used as part of different priority-setting processes. It is important to use the processes and tools in a flexible manner that is responsive to the context in which they are applied, rather than applying these tools and processes in a rigid manner that may decrease their overall usefulness for the needed objectives.

### Advantages and Limitations of Setting Priorities

Setting priorities is a difficult process that is often influenced by public clamor, cultural, historical, institutional, and political factors; development agency priorities; international agreements; judicial decisions; and the results of technical studies. Important activities to consider in setting priorities include (Ahmed and Sánchez-Triana 2008):

- Periodically reevaluating goals and addressing new or emerging priorities;
- Ensuring that the voice of the most vulnerable is heard;
- Reinforcing social accountability;
- Incorporating learning in environmental policy making and implementation; and
- Ensuring that priorities include measurable targets, operational monitoring, and evaluation.
Interaction with Other Tools and Possible Substitutes

Setting priorities relies on a number of tools that feed information into the process and help with decision making, such as strategic environmental assessment (SEA) and life cycle assessment (LCA). A number of tools discussed in other Guidance Notes serve to raise awareness of issues and could contribute to enhanced and more informed public participation (such as environmental information disclosure, and training and education). A number of tools that are at the disposal of active citizenry could also facilitate public participation in priority setting: access to information; public participation; and access to legal recourse (see relevant Guidance Notes).
Practical Examples of Setting Priorities and Lessons Learned

Boxes 1 and 2 below discuss priority-setting processes in Ukraine and Senegal.

Box 1. Use of Risk Assessment to Identify Priority Pollutants and Pollution Sources in Zaporizhya (Ukraine)

The city of Zaporizhya is one of industrial pollution hot spots where large polluting industries are surrounded by residential areas, and where privatization was made without proper attention to past and present environmental impacts. Many pollutants are regulated but, with dozens of heavy-polluting industrial enterprises, it is difficult to define which pollutant source is more hazardous and should be controlled as a priority.

Risk assessment methodology was selected because it takes into account pollutants and sources, as well as the spatial distribution of the affected population – the latter not being taken into account by current regulations. Technical assistance on human health risk assessment was provided first by US EPA (2004–06) and later supported by the World Bank (2007–10). The bulk of research work and analysis was done by the Marzeev Institute of Hygiene and Medical Ecology (Kyiv).

To carry out risk calculations, information on the location of sources, emissions levels, weather conditions, terrain characteristics, and the location of affected populations were needed. Several significant obstacles were identified from the onset: i) communication and information exchange among stakeholders were limited; ii) databases of city and government departments were not compatible, and spatial information was rarely available; iii) information on pollution sources and emission volumes was inaccurate and outdated; and iv) information on affected populations often was missing or required verification.

City authorities organized stakeholder meetings to disseminate the results of risk assessment and a special Web site was launched for information dissemination and communication. This was an important step in the consensus-building process, which was not easy. Too many stakeholders were involved: city administration, regional departments of Ministries of Environmental Protection and Public Health, owners and managers of enterprises, developers, and the public. The driving force behind the Zaporizhya effort to combat air pollution was city authorities headed by the mayor. The mayor created and led a special working group that helped secure stakeholder participation and reviewed the results of risk assessment. This working group became a forum where the need for pollution reduction and priorities were discussed.

As a result of this effort, the health risks (carcinogenic and non-carcinogenic) to particular population groups were calculated for 144 substances emitted by Zaporizhya enterprises. Later, the list of 54 priority substances was compiled. High-risk areas were mapped and affected groups of population identified. The municipality is developing prevention measures, and risk-mapping results are used by development planners. Furthermore, the city ordered calculation of risks by enterprises seeking renewal of emission permits. Several enterprises launched their own health risks assessment studies to ensure compliance and prioritize their environmental protection investments. Several enterprises have already drafted action plans to reduce risks to human health from pollution. Other municipalities in Ukraine (Kyiv, Rivne, Druzhkivka, Cherkasy, and Ladyzhyn), following Zaporizhya’s example, are implementing risk assessment techniques to minimize health risks to their residents.

Source: Alexei Slenzak
Box 2: Use of Benefit-Cost Analysis as a Tool for Setting Priorities in Country Environmental Analysis (CEA)

The main goals of the Senegal CEA were to promote better integration of environmental priorities into national and sectoral policy; guide environmental support and capacity development activities; and favor a strategic approach to priority environmental issues.

As part of the CEA, benefit-cost analyses were conducted of existing and other potential management options to ensure that scarce financial resources are made the most of. A benefit-cost analysis of malaria control, improved hand washing, improved water supplies and sanitation, and low-sulfur diesel and diesel vehicle particulate control technology was undertaken to illustrate the use of economic analysis as an instrument for setting environmental priorities. The CEA further recommended that SEA and CBA (including environmental costs and benefits) should serve as selection tools for sectoral programs.

Where resources are scarce, the programs chosen by the government should aim to maximize positive effects on the environment per unit cost. Lessons learned from successful case studies should be more widely communicated and used in policy development. Pilot projects should be encouraged to confirm the effectiveness of environmental programs before implementing policies on a larger scale. Also, feedback mechanisms should be used to quickly identify program advantages and disadvantages, and then make required corrections in a timely fashion.

References and Resources on Setting Priorities


This guidance note is part of World Bank Group publication: Getting to Green—A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
### Table 1: Comparison of Selected Tools that Could Be Used in Different Processes for Setting Priorities

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<thead>
<tr>
<th>Tool</th>
<th>What is this tool?</th>
<th>Application in setting priorities</th>
<th>Advantages/strengths</th>
<th>Limitations</th>
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<tr>
<td><strong>Tools that help in prioritizing issues</strong></td>
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<tr>
<td>Cost of environmental degradation</td>
<td>Uses economic valuation to measure the lost welfare of a nation due to environmental degradation. Such a loss may include loss of healthy life and well-being (premature death, absence of clean environment), economic losses (reduced soil productivity), and loss of environmental opportunities (reduced recreational value for beaches, forests).</td>
<td>Identifies the environmental areas with the highest impact on development.</td>
<td>Enables comparison of brown and non-brown issues.</td>
<td>Cost estimates are often approximations that are indicative of the order of magnitude and should be taken as such. Methodological issues pertaining to valuation techniques and data requirements.</td>
</tr>
<tr>
<td>Natural capital and ecosystem accounting</td>
<td>Uses economic valuation techniques to measure value of services provided by ecosystems. Ecosystem accounting seeks to integrate value of these services into national accounts.</td>
<td>Identifies the value of services carried out by ecosystems.</td>
<td>Offers policy makers an instrument for integrating environment into economic development decisions.</td>
<td>Methodological issues pertaining to valuation techniques and data requirements. Estimations are often on lower bound due to data limitations.</td>
</tr>
<tr>
<td>Macro-economic indicators</td>
<td>Wealth Estimates measure a country's total wealth as composed of produced and natural capital, and human resources. Adjusted Net Saving is an indicator of the sustainability of an economy.</td>
<td>Helps mainstream environmental (and pollution management) considerations into a framework that is relevant to key economic ministries.</td>
<td>Linked with the other national accounting measures such as gross national income, gross saving, and net saving. Adjusted net savings (ANS) provides policy makers</td>
<td>Methodological difficulties with valuing some forms of capital (such as social capital) and some ecosystem services.</td>
</tr>
<tr>
<td>Tool</td>
<td>What is this tool?</td>
<td>Application in setting priorities</td>
<td>Advantages/strengths</td>
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| Comparative risk assessment        | • It is an environmental decision-making tool used to systematically measure, compare, and rank environmental problems or issue areas. The process typically focuses on the risks a problem poses to human health, the natural environment, and quality of life.  
  • What are the risks to human health of the policy options? | • Produces a list or lists of issue areas ranked in terms of relative risks.  
  • Possible to compare several pollutants in terms of their health risks.  
  • Differentiates actual risk from potential exposure. | • CRA avoids cross-category comparisons.  
  • Does not provide overall ranking.  
  • Difficult to separate out the most important effects, and difficult to compare different types of risks.  
  • Direct comparisons cannot be made with other economic indicators; such comparisons could be helpful in allocating public and private resources. |
| Surveys and distributional analysis of environmental priorities | • Provides ways to gauge the opinions of different groups of populations regarding what they consider as environmental priorities.  
  • What are the priority issues as perceived by different socio-economic groups (for example, regional distribution, gender distribution, income distribution)? | • Allows setting priorities that would take into consideration the needs and opinions of different segments of society.  
  • Widely-used and recognized techniques.  
  • Could be administered in a simple way. | • Reliance is on self-reported subjective data.  
  • Inaccuracies resulting from possible survey flaws. |

**Tools that help in prioritizing interventions**

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| Cost benefit analysis              | • A technique that compares the monetary value of benefits with the monetary value of costs in order to evaluate and prioritize issues. The effect of time (for example, the time it takes for the benefits of a change to repay its costs) is | • Public investment projects.  
  • Public policy.  
  • CBA is a widely-used and recognized technique.  
  • It provides easy-to-understand information (in monetary terms) to the decision maker.  
  • Allows comparison of effects that | • Issues of contention in CBA pertaining to discount rates and to valuation of health, life, and environmental goods and services.  
  • Technical difficulties and dispute |
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|      | taken into consideration by calculating a payback period.  
• What policy options provide the highest economic return (have the highest ratio of benefits to costs)?  
• What policy options satisfy the highest number of identified criteria? | Assessment of impacts.  
• Contributing to development and comparison of alternatives. | Takes into account different criteria at the same time.  
• May be used to bring together the view of the different stakeholders in the evaluation.  
• Transparent and explicit (the scores and weights are recorded), and it is easy to audit.  
• May facilitate communication with decision maker and sometimes with the wider community. | Reduces rational debate about various pros and cons of proposed alternative options into discussion about abstract numbers (scores and weights).  
• Cannot facilitate consensus on very controversial decisions.  
• May create a false impression of accuracy despite being heavily dependent on a value judgment.  
• Results may be manipulated. |
| **Multi-Criteria Analysis** | A technique to assess alternative options according to a variety of criteria that have different units. MCA assigns weights and scores to options so that both quantitative and qualitative criteria can be analyzed. MCA techniques have three common components: a given set of alternatives; a set of criteria for comparing the alternatives; and a method for ranking the alternatives. | regarding methods used within CBA, such as contingent valuation. | | |

Sources: Bolt and others 2002; Bolt and others 2005; Scorecard Web site; World Bank 2011b.
Environmental Regulation and Standards, Monitoring, Inspection, Compliance, and Enforcement*

Introduction

Environmental regulation and standards refer to the set of specific rules that authorize and control a given firm’s activities so that it operates within legally and socially acceptable parameters. Monitoring the firm’s compliance with these regulations and standards is of vital importance, as this yields information for both the regulated agent and authorities. Inspection should ideally be a mere cross-check on monitoring, to confirm whether agents are in compliance. However, achieving compliance quite often requires enforcement of regulations and standards, because most firms are not always in full compliance. Environmental regulation and standards are classical command and control instruments, but they have evolved to some extent and facilitate pollution prevention and management as long as they are well designed, appropriately applied, and their use is coordinated with other policy instruments.

Description and Application of Environmental Regulation and Standards

Environmental Regulation. This policy tool imposes specific limits on firms’ ongoing activities or to changes and expansions of existing firms. Despite the importance of fairness, limits for otherwise identical firms may be different depending on several aspects of the operation, such as health or environmental risks that depend more on the surroundings than on the firm itself. Environmental regulation adopts the form of operational permits that are often issued by authorities, whether central or local government agencies, most often require are water permits, air permits, waste permits, and hazardous materials permits. When these permits are issued with common

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policy goals, they become an extremely powerful tool. However, if there is a lack of coordination between authorities, they lose most of their power, as they may not prevent pollution but merely transfer it to other media (for example, from air to water). The same applies to monitoring and to enforcement of the conditions set in permits, which should also be kept simple and be done in a coordinated way.

**Environmental Standards.** These policy tools are perhaps the oldest of environmental tools, though designed and used to control or prevent environmental health problems. Standards are categorized as either ambient or emissions standards;¹ both are important to comprehensive environmental regulation. Setting ambient standards requires an explicit agreement on environmental quality objectives that are desirable and the costs that society is willing to bear to accept these objectives. Since ambient standards can be set at different levels for different locations, they can be used to protect valuable environments. Ambient standards also offer a simple method for setting priorities with respect to focusing efforts on pollution management, since areas that comply with ambient standards are considered to require no further intervention.

Emissions standards typically set maximum emission limits of particular pollutants to one or more media, and these limits are usually based on the best available and economically feasible technologies, thus forcing agents to move towards those technologies. Standards have typically been expressed in concentrations, but there is increasing use of load-based standards, which reflect the overall objective of reducing the pollution load on the environment, and also discouraging excessive resource use for dilution of emissions to comply with standards. Alternatively, emissions standards can be established by estimating the discharges that are compatible with ensuring that receiving areas around the firm meet the ambient standards defined for the pollutant. This however requires considerable information on both the sources and the ambient environment, and varies from area to area. New source performance standards are specific emissions standards for new plants. They tend to be stricter as they assume that new plants can more easily adopt cleaner processes at the design stage.

Most standards are set on an activity basis and in terms of one or more pollutants that affect a specific medium (for example, air, water, and soil). This is done because it is deemed to be simpler and more effective, although it has many shortcomings and risks. Standards have also historically focused on simple pollutants, like BOD, and this derives from their being relatively easy to detect and measure. Attention has now moved to other more persistent pollutants (such as heavy metals and poly-carbonated biphenyls — PCBs) which may be less obvious, but which tend to accumulate and are non-biodegradable, thus resulting in more severe health impacts. Several international conventions (for example, Basel Convention², Rotterdam Convention, and Stockholm

¹ The World Bank Group has a set of good practice technical guidelines with respect to ambient and emissions standards for different industry sectors. The reader may find these useful to review in conjunction with this policy note. These Environmental, Health, and Safety Guidelines are available at http://www.ifc.org/ifcext/sustainability.nsf/Content/EHSGuidelines (IFC 2011).

Convention on Persistent Organic Pollutants) address some of these persistent pollutants.

If standards are not set within a clear policy framework and according to clear priorities, they may result in preventing or controlling pollution in a particular medium, but at the same time may induce a transfer of pollutants to other media. Hence, not only does the policy design and framework need to be consistent and clear, but the development of standards must also take into account effects on transfers of pollution across media, in order to avoid creating new problems. There is no correct way to set standards. It requires an iterative process that allows for consideration of both environmental and economic benefits. This is one reason why it is not appropriate to import standards from other countries, and also why it is important to ensure periodic re-evaluation in order to determine if standards are responsive in furthering national environmental policy.

It has also been argued that if a standard is set to protect the environment, its sole purpose is to internalize environmental costs and avoid environmental damage. Thus, the cleaner an industry is, the lower its required investment in pollution control. This definitely creates a bias in favor of cleaner activities and cleaner firms, which in actual fact may be seen as a cost correction. Yet, standards that have been set this way face the difficulty of discouraging economic activity in the short term or worse. Quite often standards are based on a particular technology as the solution to a problem, forcing some agents to mount an undue effort and forcing others to adopt the technology which may not in practice solve the problem.

Standards, however well designed, normally impose financial and economic burdens on the agents that have to comply with them. Although it is difficult to compare environmental benefits with financial costs, an effort must be made to ensure that the cost of implementing a standard does not exceed the social benefits it creates. In this sense the regulated agents and other stakeholders within society should participate significantly in the design and development of the standard, and this must be done without favoring any party, be it the regulated agents, or authorities and civil society. Avoiding an environmental problem always seems a good objective, but sometimes the solution involves closure of plants, loss of jobs, and at times even indirect negative environmental effects. Standards must be strict, but must not go against sustainability.

**Monitoring.** The monitoring of activities or agents that have to meet environmental standards is as important as the nature and quality of the standard itself. If limits are not clearly measurable, the compliance with standards that cannot be easily monitored by the agents themselves or by authorities renders the tool virtually useless. Thus, methods to verify compliance with standards must be as clear and as simple as possible so that the agents can know how they perform vis-à-vis the standard and whether they can prevent actions that might put compliance at risk. Similarly, authorities should be able to determine accurately and rapidly if the agents are compliant.
Adequate monitoring diminishes the need for inspection and the cost of inspection itself, although here again we often find that agencies impose monitoring according to their own needs and increase costs significantly. In most countries inspection is done by the agencies themselves or in a specialized manner, focusing on particular issues. This often leads to biased results, as some important shortcomings may be overlooked, whereas less important problems are stressed. In some cases, potential conflicts may arise if there are significant differences between the monitoring technology and inspection methods used. Furthermore, in some activities where shifts can be made rapidly, pollution transfers may occur (see box 1). A coordinated monitoring process would lead to a decrease in overall costs of regulation and improve outcomes.

**Inspection.** If there are costs that have to be faced by agents to comply with the limits set in the standard, the effectiveness of inspection is crucial. The higher the risk of being caught out of compliance for a particular agent, the more likely its behavior will effectively change, although this also depends upon the level and effectiveness of fines. In the same way as a proper balance should be sought in the development of standards, a balance between inspecting authorities is also crucial. If a certain group of standards is not adequately addressed in inspections, then there may be a perfectly designed set of standards, but they will not induce the desired changes in behavior. Current best practices tend to unify or coordinate inspection activities even if these are by different authorities.

Standards in general impose conditions that must be met by all agents and seldom take into account environmental or health risks that may require more strict limits in particular zones, though this should be common practice. In general site-specific or critical local conditions should not determine standards, as these should be dealt with in a different manner – that is, through specific environmental regulation of firms or activities in particular areas.

**Adequate enforcement.** For environmental regulation and standards to be effective, there must be strength and credibility behind the policy. Strength derives from both the likelihood of inspection and the level of fines. If the cost of compliance is higher than the fines that may be imposed and the likelihood of being caught is low, given the weakness of inspecting agencies, most agents will not seek to be in compliance, unless non-compliance has other

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**Box 1. Monitoring in Mexico**

An example of pollution transfers between media is the case of water and air inspections during the Presa de Silva crisis in Mexico in 1996, where chrome discharges to water were known to be a problem. Every time water inspectors visited shoe-manufacturing plants, legal reasons compelled them to wait a day.

When the inspection took place, discharges were perfectly within limits, while air emissions created discomfort for the neighbors. When air authorities visited the same plants and inspected them a day later, their air emissions were within standards, though the water was foul.

It took the water and air inspectors about a week to accept that unless they did a joint visit, they would never find problems, and when they agreed to do it they found that both air and water parameters were out of bounds, thus reaching an adequate assessment and diagnosis. This led to clean technology projects for these shoe-manufacturers, which eventually became compliant.
consequences that actually increase the cost, such as closure of operations for periods of time or loss of market share or niches.

A question that has no definite answer is whether inspection and enforcement should be part of the responsibilities of the regulating authorities or carried out by a separate agency or agencies. The preferable solution depends more on how coordinated inspection is with direct regulation and the standardization process, than on a particular institutional setting. Separating command and control reduces the discretionary power of agencies, whereas putting them together under a single management increases the likelihood of coordination. Promotion of compliance through voluntary instruments is extremely valuable both to diminish the inspection requirements and to increase compliance and best practices.

**Prerequisite Factors for Environmental Regulations and Standards**

*Adequate Timelines.* Best practices in standardization: To avoid high costs and to allow firms to adapt properly, time should be allowed for firms to change their technology, although this crucial factor may become a reason for failure if deadlines are either moved by the authority, or agents feel that they will not have to comply. Other ways of avoiding high costs of implementation of standards are to explicitly combine them with economic instruments, such as tradable permits. However, these solutions more often than not follow a sequence where the standard is set, then monitoring becomes reliable for all actors (including government), and only after that will the application of tradable permits be possible.

*Agency Coordination.* All authorities that intervene in the permitting of a specific firm should be aware of the effect their particular action has upon the firm and upon the particular conditions imposed by others, but often this is not the case. Water authorities are focused on avoiding polluting water discharges, and air authorities on avoiding air emissions. Waste is often divided between central and local government agencies, with this being a central government issue in the case of hazardous or toxic waste and a local issue for all other waste. Unless all authorities are coordinated, it is quite likely that different permits will have different degrees of strictness, and may thus induce the transfer of pollutants from one medium to another. Pollution prevention focuses on preventing the generation of pollutants, and yet if permitting is not carried out in a multi-medium manner, it may have the effect of, for example, simply transforming toxic waste into toxic gases and toxic water discharges.

The need for coordination is clear, but there are huge obstacles to achieving it in actual practice. For every government agency, the more restricted its goals are, the better; thus, the agency only requires information that concerns its subject. As a consequence, although government and environmental policy should have a global picture of a firm, it quite often has only bits and pieces, and each agency lacks the information the others have. Consequently, each agency reaches a biased assessment, based on its particular interest, rather than a coordinated view of the problems and trade-offs. This is exacerbated by the fact that firms
normally react to particular permits one at a time, because they are seldom issued simultaneously. Thus, an effective instrument for pollution prevention quite often becomes an instrument for pollution transfer, where the most affected medium is the one being regulated by the weakest agency.

Coordination is the only way these transfers can be avoided, and this would foster prevention. However, coordination requires enormous political will and a clear environmental policy design. Europe had both, and since 1997 it has been unifying all permitting criteria and centering them on promoting the best available and economically feasible technology. Furthermore, this has come with differential incentives for different sizes of firms, and has been set as community law. However, not all regions or countries have succeeded in coordination.

**Local Knowledge.** The development of standards requires a solid scientific and technological basis as well as a good assessment of the weaknesses and strengths of the country’s productive structure and its effects on pollution. Thus, a critical mass of researchers, industry, civil organizations, and public institutions is necessary and may not often be found in developing economies, which often results in the adoption of other countries’ standards, trying to take into account plausible effects. See box 2 below.

### Advantages and Limitations of Environmental Regulations and Standards

**Certainty.** A benefit of standards that is seldom acknowledged is they provide certainty to agents and enhance their ability to adapt to social demands on their behavior. Thus, although standards represent costs, which are often not negligible, they also have advantages for private firms, as their planning horizon is more clearly outlined.

**Transfer Pollution Medium.** A common danger to both standards and environmental regulation is that they may not induce pollution prevention in the sense of fewer pollutants, but that they may induce pollution transfers from one medium to another. This should be avoided as much as possible, and it requires that an accurate and common diagnosis of the problem be reached across all agencies. Integrated pollution prevention and control (IPPC) approaches as have been required by the EU for more than a decade address this issue. Such approaches are also becoming more widespread in developing countries, such as South Africa.

Standards should not center on one particular medium, but on the effect of the pollutant on all media, and this can be achieved either by a unified standard or through coordinated standards. Similarly environmental regulation should avoid establishing

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**Box 2. Water Temperature Regulations**

A typical case of the adoption of imported temperature limits involves regulating water discharges. In many tropical countries, absolute limits were imposed on maximum discharge temperatures (especially in the case of hydroelectric plants), and often these imported limits were lower than the temperature of incoming water to the generating plant.

This problem was usually solved during the development of the standard, as electricity generating firms normally take part in the process of standardization, but at times this posed problems to plants using particularly warm upstream water.
weak limits in one or more areas, as this will most likely be the source of increased pressure upon the medium with lax limits.

**Strictness.** Making a standard too strict will often promote unwanted results, as regulated agents may not be able to bear the cost of meeting the standard, or are no longer allowed to do what they were doing and have to do something environmentally worse. See example in box 3.

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**Box 3. Regulation of Hazardous Waste in Mexico**

An example of unwanted results of environmental standards in Mexico was the declaration that classified used oil as a hazardous waste and the imposition of a number of restrictions on its disposal, with poor enforcement. As a result, the cost of handling used oil according to the new regulations skyrocketed.

Most small users of oil opted to deny they generated used it, and a black market for used oil appeared where informal brickyards substituted used oil for cleaner fuels. Thus, there was both a loss of control and a host of new problems.

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**Scope.** Another typical case where standards are not an adequate tool to achieve policy goals occurs when a single agent or a small number of them create an acute local problem. In such circumstances, direct and specific environmental regulation becomes the perfect complement for standards. If a small number of agents create a problem, a modification of their operational permits would be the best solution to the problem, making them face stricter limits than other similar agents. This may seem unfair, because it goes against the notion of a technologically level playing field, but it enables authorities to solve local problems in a more efficient way.

**Interaction with other Tools and Possible Substitutions**

It is very difficult to regulate, or enforce through a standard, the total number of agents operating in a given area. Thus, the number of agents may exceed the particular carrying capacity of an area even when all agents are in compliance with applicable regulations. These situations require other tools, such as land use permits, tradable emission permits, or other limitations on the number of agents. Yet, differentiated standards can significantly enhance results if combined with other instruments and if differentiated limits are set to impose a greater effort on agents in areas with higher activity density (see box 4).

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**Box 4. Differentiated Air Quality Standards**

A good example of differentiated limits to solve a problem involving large numbers of agents are emission standards for vehicles in highly contaminated cities, where the policy objective is to improve air quality through diminished vehicle emissions. These standards state that vehicles with emissions above a certain level cannot be used every day in the particular area, but the strict standard applies only to cities with severe problems or where a trend towards these problems is present and needs to be stopped. Relatively less clean vehicles are allowed to circulate every day in other cities and towns and in rural areas, as the very strict standards are not required. This has been partially successful in Santiago de Chile and in Mexico City.
Most economic instruments entail artificial prices that require scarcity, which can be created partially through command and control; most economic instruments also require adequate monitoring. This creates situations of complementarity. In such circumstances, a good standard can be much less costly if a market is envisaged along with it than if it relies exclusively on inspection and enforcement. The best example of this is the SOx – NOx regulation of utilities in the United States, where the emission standard was modified and a market was created. It is important to note that more often than not, markets require standards and monitoring in place in order to operate. Likewise, voluntary instruments, used in conjunction with standards and regulations, may significantly reduce the cost of regulations and simultaneously achieve enhanced results. In addition, other tools, such as EIA, require standards to be in place to be able to assess objectively whether a project needs to mitigate its impact on the environment.

**Practical Examples of Environmental Regulations and Standards**

**Mexico.** The Programa de Industria Limpia (Clean Industry Program) in Mexico seeks to promote pollution prevention by creating incentives (basically public recognition and fewer inspections) for firms that adhere to a commitment to achieve environmental targets that go beyond compulsory requirements. This process has been extremely successful for large firms that seek the recognition, and has also helped inspections to target hot spots rather than large firms, given that the latter ensure compliance through the program. (PROFEPA, Programa de Industria Limpia, www.PROFEPA.gob.mx).

**United States.** The U.S.’s water emissions standards stem from the Clean Water Act and require discharges to undergo tertiary wastewater treatment regardless of the firm’s activities. The design of these standards assumes that a tertiary treatment plant for water discharges would solve most if not all water quality problems and would not bias competitiveness between industries, as firms would all face similar marginal costs regardless of their activity as a result of the standard. In practice, this has meant that firms whose discharges are relatively clean have had to face significant costs to treat the water, whereas others where tertiary treatment is not enough have been acknowledged as being in compliance with the standards. Most Latin American countries have imported the same philosophy in developing their standards (albeit only requiring either primary or secondary treatment for discharges rather than tertiary treatment). This has led to similar shortcomings.

**References and Resources for Environmental Regulations and Standards**


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Environmental Impact Assessment

Introduction

The main focus of this Guidance Note is the use of EIA as a policy tool available to policy makers for effective pollution management.1 EIA facilitates pollution management through its link to environmental standards by identifying if the proposed investment or development project satisfies applicable environmental standards or needs, and mitigating impacts to comply with standards. Furthermore, EIA enhances public participation and engages stakeholders to inform decision makers of different views.

Additionally, EIA, in conjunction with monitoring tools and recourse mechanisms, allows the gathering of information on environmental quality and provides a venue for expression and discussion of diverging opinions. This Guidance Note does not discuss the technical aspects of preparing an environmental assessment, since numerous resources and good practices are available on preparing an EIA. Instead, this Note focuses on the broader use of EIA as a policy instrument within the range of policy instruments discussed in this toolkit, and which are available to different stakeholders for pollution management.

Description and Application of Environmental Impact Assessment

The environmental assessment process would usually, according to the various international approaches currently implemented, incorporate the following main stages: screening to determine applicability and level of detail of an EIA; scoping during which issues that should be taken into consideration are identified and the terms of reference for the EIA are completed; preparation of the environmental assessment report, including identification of impacts, evaluation of alternatives,
and design of mitigation measures; and the preparation of the environmental management plan, which is usually part of the environmental assessment report, but can be a stand-alone piece for simple projects. Public participation and disclosure are important attributes of the EIA process in many countries.

The United States was the first country in the world to introduce environmental assessment as part of the National Environmental Policy Act (NEPA) in 1969 as a tool that would lead to implementation of NEPA policies. The environmental assessment process had two major purposes: ensure that decision makers are making informed choices regarding impacts on the environment and open the process to citizen involvement (CEQ 2007). Over the past 40 years, EIA entered the fabric of environmental governance in over 100 countries worldwide (Glasson and others 2005).

EIA also became an important instrument for environmental sustainability for multi-lateral development agencies, including the World Bank. The Bank introduced EIA – as one of its ten environmental, social, and legal safeguard policies – to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations (World Bank 1999). Even though most EIA systems follow the steps of the generic EIA, there are substantive and procedural emphasis differences:

**Nature of EIA.** A country’s legal system and its political, administrative, and cultural context play an important role in shaping that country’s EIA system, and account for differences in EIA systems among countries. As a result, the use of EIA as a tool varies among countries from its consideration as an administrative process that helps incorporate environmental and social concerns of different stakeholders into the decision-making of authorities. Underlying the value of EIA is the view that environmental decision-making processes are strengthened when the responsible authority can systematically incorporate the views and opinions of all relevant stakeholders regarding the decision at hand – as is the case in the U.S. (CEQ 2007). An alternative vision of EIA considers this instrument as an environmental management tool that helps control the environmental impacts of a broad range of projects, such as in Brazil where authorities often establish design and operational conditions through the EIA process (World Bank 2008), or Guatemala (World Bank 2006c) and Nepal (World Bank 2007b), where EIA became the main policy instrument to minimize or mitigate environmental impacts. Such alternative conditions have generated various ‘models’ of EIA, such as those proposed by Doberstein (2004) who distills two models of EIA: a ‘technical model’ and a ‘planning model’, as two extremes of a continuum with systems of most countries exhibiting a mixture of these. He further notes that most developing countries start with a form of EIA that most closely matches the technical model characterized by a focus on the project level, with weak public participation and reliance on quantitative measurement rather than qualitative perceptions.

**Screening.** Prescriptive and standardized approaches are two general methods for screening. They are defined through positive or negative lists in legislation and regulations, and discretionary or
customized approaches where indicative guidance is relied upon to determine requirement for EIA on an individual or case-by-case basis (UNEP 2002). Figure 1 presents a framework for screening (UNEP 2002).

Screening tools include positive lists that identify activities that require EIA; negative lists that identify activities that are excluded from EIA requirement; expert judgments; or a combination of lists and expert judgments. Screening could also include analysis of impacts and risks, such as in the United States, where EIA applies to investment activities that can pose significant negative impacts.

**Scoping.** Identifying the scope of an EIA study is an important aspect of the EIA process, and as with other aspects of EIA, countries differ in how scope is identified. In some instances, EIA scope is determined either through formal (for example, Ecuador and U.S.) or informal (such as in Peru) consultations; or defined by the legal framework without providing opportunities for public input (for example, Colombia). Terms of reference for EIA are then prepared based on results of consultations, legal requirements, or based on generic terms of reference. An important factor in determining the scope of an EIA is drawing the boundary of the impacts of the proposed activity issues that are appropriately addressed through the EIA process, and making sure that issues that remain outside of this boundary are addressed by other instruments such as Strategic Environmental Assessment (SEA), cumulative impact assessment study, and land use planning.
Preparation, Approval, and Supervision. Supervision of the EIA preparation usually falls either on the sectoral agency (for example, Peru, Ecuador, US), or on the environmental agency (for example, Belize), or is a responsibility shared by sectoral and environmental agencies (for example, Argentina). The environment agency’s role could range from review and provision of comments about the adequacy of the analysis and the impact on the environment, ensuring public participation in the EIA, to the approval of the EIA, including prior approval of the terms of the reference through the screening and scoping stages. Moreover, in many countries, agencies at the local level (provincial / municipal) are responsible for supervising EIA preparation. For example, in Pakistan the federal environmental protection agency (EPA) has jurisdiction over all EIAs, but often delegates its power to provincial EPAs, resulting in provincial authorities having jurisdiction for the vast majority of EIA cases except for those involving federal land, military projects, and trans-border or trans-provincial impacts (World Bank 2006d).

Many agencies establish registers for consultants, or technical specialists, or firms that carry out EIA (for example, Bangladesh and Guatemala) and some seek to issue certifications or provide learning courses for EIA practitioners in attempts to improve EIA quality (World Bank 2006a; 2006c; 2006f). Project proponents, together with the consultants often hired by them to prepare EIA, have significant effects on EIAs’ quality and objectivity. The capacity of EIA practitioners has often been cited as an important factor in the quality of EIAs, alongside resources allocated to EIAs by proponents (Nadeem and Hameed 2008).

Public Participation and Public Disclosure. Countries vary widely in the extent to which EIA relies on public participation, ranging from countries where opening the decision-making process to citizen involvement is one of the main purposes of EIA, to countries where public participation and involvement in the EIA process are not required by EIA regulations and rarely practiced. Most countries fall in between, with regulations that require public involvement at various stages of the EIA process (at screening, scoping, EA preparation, and before and after government decisions).

A study of the effectiveness of the EIA Directive in the EU (COWI 2009) revealed that two main benefits of the EIA procedure were it ensures that environmental aspects are taken into consideration in the decision-making process, and EIA ensures transparency in environmental decision making. Countries also vary with respect to interagency coordination; legal provisions regarding access to information — for example, the EU directive was modified to accommodate the provisions of Aarhus convention (EC 2009); public hearings; and creation of opportunities to receive public input during various stages of the EIA process.

EIA systems vary in terms of how technical the EIA process is perceived to be, from those where it is seen as a technical process left to technical experts, to systems where the EIA process is seen as more participatory with respect to public involvement. Similarly, disclosure of EIA varies between countries where disclosure of EIA is mandatory, to countries where there is no legal requirement for disclosure of
Prerequisite Factors for Environmental Impact Assessment

In designing or modifying the EIA system, it is important to have clarity regarding the purpose of the EIA and what it should and could accomplish within the broader policy framework: whether the need is for a technical report focused on preparation of mitigation measures for the identified impacts, or instead for a tool to open the decision-making process to public involvement. An overall regulatory framework within which the EIA tool is anchored should be established. This framework is an important element in the successful application and use of EIA (UNU 2011).

As evidenced by experiences in El Salvador and Guatemala (see below), over-reliance on EIA is better avoided; instead, a mix of tools should be utilized to achieve the goals of environmental management. The organization responsible for preparation and review of EIA needs to have the required capacity for the EIA system’s intended purpose, to ensure that the public participation and technical aspects are implemented. The required capacity includes knowledge of procedures, analytical work, and technical and social skills. Finally, the availability of baseline data is important in implementing and operating an EIA system (UNEP 2002).

Advantages and Limitations of Environmental Impact Assessment

Public Discussion and Participation. One major strength and outstanding feature of EIA in many countries is increased public discussion and participation (COWI 2009). However, in practice a number of limitations occur. In some instances where public participation is required by EIA legislation, such participation could be limited in practice. For example, the law in India required that a public hearing is conducted; however, NGOs often considered the public hearing as a staged process that appeared to involve citizens when the decision had already been made.

In response, the 2006 EIA notification changed the requirement from public hearing to public consultation in an attempt to force project proponents to proactively seek the views of affected communities. In other instances, where projects are only discussed openly for their potential environmental merits and shortcomings, but not for social or economic ones, public discussion could focus on allegedly environmental problems when there are underlying social or economic reasons for delaying or stopping a project (World Bank 2006e).

Over-reliance on EIA to Achieve Environmental Management Objectives. EIA should be used in conjunction with other policy tools and should not be over-emphasized for achieving environmental management objectives. For example, in El Salvador, the National Environment Law (1998) introduced nine instruments of environmental policy including, among others, environmental zoning, environmental
evaluation, environmental information and public participation, and economic and financial incentives.

However, the implementation of the environmental policy focused on the EIA, and this led to over-burdening the tool. Further development of other instruments was recommended to complement a comprehensive environmental policy (World Bank 2006b). South Africa, where EIA is applied within the framework of an integrated environmental management system, the Strategic Plan for the Environment Sector has called for developing a broader ‘toolkit’ of environmental impact management approaches and instruments in addition to EIA in order to address the issue of over-reliance on EIA (see Tarr 2003).

Time-Intensive Process. An effective screening system is important to ensure that the EIA does not become a prerequisite for too many activities, thus limiting the responsible authority’s ability to adequately assess important projects and weakening the legitimacy of EIA. For example, in Colombia the lack of a screening procedure resulted in an EIA being required for any project, regardless of the intensity and magnitude of its potential impacts, location, the sensitivity of the surrounding area, or public opinion regarding the project. The need for vast numbers of EIAs coupled with an absence of baseline environmental data resulted in mass production of EIAs of poor quality and little value.

Lack of screening has led to a situation where the EIA regulations become a hurdle to projects and add little value to the environmental planning and management processes for which they were intended (World Bank 2007a). Similarly, in El Salvador, broad screening procedures have led to a situation where 300–400 EIAs were prepared annually. The number was beyond the capacity of the responsible reviewing authority (MARN), and resulted in a backlog of 2,500 EIAs, and led EIA to becoming a bottleneck to development (World Bank 2006b).

Potential for Rent Seeking. Where the EIA is linked to the licensing process, it may become a tool for rent-seeking and could be a source of illegal influence on the responsible authorities. For example, in Bangladesh, the Environment Conservation Act (1995) required environmental clearance for development projects, but it also reserved the right to the government to waive the clearance requirement. This provided the incentive for project proponents to exert influence to avoid this requirement. Because public consultation and public participation were limited, these two forces for were precluded from countering the illegal influence, and they were blocked from providing an incentive for the effective identification and mitigation of potential environmental impacts (World Bank 2006a).

Interaction with other Tools and Possible Substitutes

EIA is more effective when applied in combination with other policy tools and mechanisms for environmental management, such as environmental regulations, standards, enforcement, and monitoring systems; land use planning; and market-based incentives. In many legal systems, the judiciary provides an important avenue for recourse.
Furthermore, public participation is enhanced through tools that promote access to information, advocacy and participation in decision making, and ability to complain and access to legal recourse.

Moreover, in many legal systems, the approval of an EIA is a requirement for environmental licensing, and the two tools are closely linked. In countries where EIA is regarded as an environmental management tool, EIA is often linked to the licensing process, and approval of the EIA is often a prerequisite for granting a license. For example, in Jordan the approval of an EIA is a prerequisite for any and all licenses or permits required prior to construction (World Bank 2010). On the other hand, in the US, EIA is not linked to environmental permitting, but is rather a way to open the decision-making process to public scrutiny. For permitting purposes, the U.S. system relies on other instruments such as zoning plans, and standards and regulations.

Many instruments inform the EIA process. For example, SEA extends the application of environmental assessment from projects to policies, plans, and programs, and assesses environmental aspects considering their inter-linkages with social and economic factors. Risk assessment may also feed health-issue considerations into the EIA process for projects requiring thorough examination of risks to human health, and could either proceed separately of EIA or be integrated within the EIA process (Demidova and Cherp 2005).

Despite these risks and limitations, EIA remains a useful tool for two reasons. First, it does drive developers of new projects to take environmental impacts and risks into account (partially internalizing the cost). Second, it allows or may allow governments and society to analyze projects in depth. Yet this is an expensive process with regard to both inputs and time. Even when studies are of excellent quality, the process may reach wrong conclusions because EIA takes the project’s effects into account but seldom are cumulative effects considered. Hence it is important to apply EIA selectively, but also apply it in conjunction with other tools that take cumulative effects into consideration.

References and Resources for Environmental Impact Assessment


2.2. Private Sector (Including Large, Medium and Small Enterprises)
Environmental Management Systems*

Introduction

An environmental management system (EMS) is a tool to implement a structured program of continual improvement in environmental performance. An EMS follows procedures drawn from established business management practices and principles of quality management systems. The concept is straightforward. If their management commits to, and supports, EMS, then large companies, small and medium-sized enterprises (SMEs), and privately owned organizations of various types and sizes can easily apply the principles of EMS. Examples include publicly traded companies, public-private organizations (such as utilities, roads, and energy production and distribution), government structures at national and sub-national levels (such as municipalities), and financial intermediaries.

Description and Application of Environmental Management Systems

An EMS can take a variety of forms and complexities. It can be stand-alone, or fully integrated with all business processes; it can be formal or informal. It can be externally certified or self-declared sufficient in its scope, content, and operation. The design and implementation of an EMS should, however, be singular in its intent. It should provide an organization with a structure that permits the establishment to understand the social and environmental impacts and risks associated with the organization’s activities. Furthermore, an EMS should provide a means to ensure that the organization subsequently manages these impacts and risks according to what is important to the organization.

As indicated above, a management system is a tool to implement a structured program of continual improvement in environmental performance. Therefore, an organization must develop its EMS according to structured, clear, and auditable elements. Figure 1 highlights the 17 building blocks required of an EMS as defined in the international standard for EMS, ISO 14001:2004.
An EMS must include a cycle of planning, implementation, monitoring, and management review stages with regard to environmental risks and impacts. The planning stage involves the identification of what is important. This may include the environmental, social, health, and safety risks and impacts. In the planning stage, the organization must decide how to best mitigate these risks and impacts given the resources available.

The implementation stage encompasses the period of institutional learning as the organization introduces these policies. Almost in parallel with the implementation stage, the monitoring and review stages require that the organization check its own performance and act when that performance is not appropriate or needs enhancing, to ensure progress stays on track.

Adoption of an EMS can assist enterprises in developing countries to obtain financing, to be competitive in the market, and to access new clients, including large corporations. The IFC, the World Bank Group, and other international financial institutions, such as regional development banks, have specific environmental mandates for financing business activities that are environmentally sound and sustainable. These organizations generally require the development of appropriate management
systems to control the risks posed to both society and the environment from those business activities.  

**EMS Standards and EMS Certification.** EMS is both an internal management tool and a tool to manage and communicate an enterprise’s environmental performance to internal and outside parties, including its workers, regulators, local communities, commercial partners and investors, bankers and insurers, and the general public. Effective communication requires some level of standardization and common understanding. The best known international standards for EMS are the ISO 14001 series and the EMAS.

**ISO 14001.** The International Organization for Standardization (ISO; see ISO Web site) developed the ISO 14000 series. The overall approach and broad success of ISO’s quality management standards (the ISO 9000 series) form the basis for the ISO 14000 series. ISO 14001 is a voluntary standard to provide a framework for a holistic, strategic approach to the organization’s environmental policy, plans, and actions, thereby setting out the basic structure for an EMS. ISO 14004 provides relevant guidance. The emphasis of ISO 14001 is threefold:

- compliance with legislation and any other requirements, programs, or plans that the organization subscribes to – for example, industry codes, lender’s requirements, and regulatory guides;
- prevention of pollution by avoiding, reducing, and controlling pollutants; and
- continual improvement of the EMS to enhance the overall environmental performance of the organization in line with its environmental policy.

Organizations can apply the standard throughout the world and for any type of business activity. ISO 14001 defines the standard elements of a system, thereby making it possible to independently audit and certify that system. Although it requires a commitment to legal and regulatory compliance, along with a commitment to continual improvement, ISO 14001 does not specify levels of environmental performance, and therefore, a wide variety of organizations can implement it, irrespective of their level of environmental maturity.

**EMAS.** Another international EMS standard is the European Eco-Management and Audit Scheme. The International Finance Corporation (IFC)/World Bank Group (see Equator Principles website www.equator-principles.com).
(EMAS; see EMASeasy Web site). EMAS is broader in its requirements than ISO 14000. In particular, EMAS covers all the standard requirements of ISO 14001, but also

- requires an initial environmental review before implementing the management system;
- aims to go beyond legal compliance and target best practice;
- implements an independent EMS validation program for an initial period; and
- requires the publication of an independently validated annual environmental statement detailing environmental performance.

**EMS Certification.** EMS has two basic pillars: (1) EMS certification is voluntary, not mandatory; and (2) the enterprise decides which EMS standard to adopt. An organization will decide if and how to establish, adopt, maintain, and develop an EMS. Then, the organization will decide how to demonstrate conformity with the standard voluntarily adopted. An organization can demonstrate conformity in several ways: (a) making a self-determination and self-declaration; or (b) seeking confirmation of its self-declaration by a party external to the organization (for instance, an assessment of conformity by a business client); or (c) seeking certification (or registration) of its EMS by engaging an external qualified body (that is, an accredited certification body).

An EMS attains certification when a certification body completes its inspection of the enterprise’s EMS system and makes a formal declaration that the system conforms to the requirements of the adopted standard. The process of accredited certification is therefore a means of demonstrating that the enterprise is adopting a standard and recognized framework for environmental management practice via a trusted partner. Although conformity does not always mean best environmental practice, this is important in the context of increasingly stringent legislation and rising concern from interested parties.

Using a certification body is typically a two-stage approach where the certification body reviews the EMS documentation against the standard. The certification body then recommends whether the organization is able to progress to the next stage of assessment – that is, to a formal on-site audit of the EMS in practice. If this is the case, the certification body will visit the enterprise to review all operational areas and evaluate performance against the standard and associated legislative compliance requirements. The outcome depends upon whether the enterprise’s EMS successfully fulfills all standard requirements. If so, the evaluating body produces a certificate detailing the scope of the EMS, the standard, and the organization’s details. Certificates are valid for a limited amount of time set by the certification body (and generally no more than three years). Throughout that period, there will be a continual audit cycle to enable successful continuation of registration to the standard.

While there are many certification bodies, these organizations must ensure they are exercising due diligence, and that the enterprise applying for certification is receiving an impartial service that fully embraces the concepts of continual environmental
improvement. The issue of accreditation of certifiers is becoming increasingly important as demand for their services grows. Since the onset of the certification systems, there has been an inherent risk of having second-class certification bodies and systems. The role of government as a regulator of certification auditors is vital to program success. Specific mechanisms are available to mitigate the risk and ensure certification credibility and acceptability in the international marketplace and not only within one country’s boundaries. These mechanisms include an international forum of national accreditation bodies (International Accreditation Forum, IAF) that examines mechanisms for achieving international reciprocity through multilateral agreements (IAF Multilateral Recognition Arrangement, MLA). Certification bodies must adhere to specific standards, such as ISO 17021 (Conformity assessment – Requirements for bodies providing audit and certification of management systems), which place great emphasis on the impartiality of the certification process and the competence of all personnel, managers, administrators, and auditors of the certification body. An enterprise considering certification of an EMS should ensure that the certification body has full accreditation under the relevant standard.

Application to Small and Medium Enterprises (SMEs). Most of the development and application of EMS have taken place in large companies and organizations. The development and use of such systems in SMEs continue to be limited. SMEs need to focus on economic survival and profitability, and often perceive environmental management as unnecessary due to their small scale and as a costly burden against their own primary concern.

The managerial and technical resources of SMEs often have limited knowledge regarding how their enterprise affects the environment, and limited knowledge about how to manage their environmental performance. Furthermore, SMEs have limited resources to dedicate to environmental considerations, and they have short-term pressures on cash flow. In addition, there are significant challenges specific to developing countries, where (i) more financial and technical constraints often exist; (ii) appropriate infrastructure is less available or accessible (as, for example, for waste management and sewerage), posing another challenge to the enterprises in dealing with environmental aspects; and (iii) the legal framework is less developed and/or effective. Although these challenges do not prevent the development and implementation of an EMS, they may pose serious obstacles, create an additional financial burden and frustration, and eventually constitute substantial disincentives for the SMEs.

Some difficulties encountered by SMEs relate to more technical issues, such as defining the organization’s environmental aspects and impacts. These definitions sometimes require specialized technical knowledge and understanding, which can add to the overall financial impact of developing an EMS. Finally, while the costs of certification that local ISO certifiers carry out in developing countries tend to be significantly lower than in developed economies, certification may become relatively expensive, if national certification and accreditation bodies are non-existent, or if
overseas markets do not accept certification by national bodies.

In recent years, international organizations have created several support tools (see References and Resources section of this Guidance Note) to help SMEs develop an EMS using simple and tested methodologies with limited burden to the enterprise. The owners and administrators of enterprises often believe that training and enhancing competencies within organizations require employing a specialist and taking personnel out of the work arena for long periods, but this may not always be the case. Targeted training in management and quality control can improve overall performance, including environmental aspects, and can provide a basis for EMS development. Training could consist of short sessions in practical settings within the working environment where, for example, internal personnel review operational controls or demonstrate how to put emergency preparations and responses into place in real environments. Web-based methods now available are instrumental in improving knowledge and communication both internally and externally.

Prerequisite Factors for Environmental Management Systems

**Staff.** For an effective EMS, the following steps are necessary:

1) Obtain and maintain management commitment.
2) Conduct a focused baseline assessment to identity what really matters for the organization in terms of environmental performance.
3) Draft an environmental policy stating the company’s intentions and its commitment to compliance with legal and other applicable requirements, and its commitment to continual improvement of its environmental performance through pollution prevention.
4) Develop measurable and simple indicators of environmental performance.
5) Properly staff and structure the organization so it can design, implement, monitor, and review all of the preceding steps.

An organization can use its existing production-based and quality-based management systems as a foundation on which to build the elements of an EMS consistent with internationally recognized standards. Management systems require similar types of procedures for document and record control, communication, internal audit and inspection, reporting non-conformances, and implementing corrective and preventive actions.

Staff already acquainted with the concepts of quality management and safety management will adapt more easily to the EMS requirements. Additionally, with previously trained staff, the time spent establishing and running an EMS and documenting the performance indicators will be less. Analyses have shown that higher capacity and access to resources in an enterprise typically cause the costs of adopting an EMS to decrease.
Costs. Typical costs to set up an EMS, including external consulting fees as well as communication and registration costs, can range from approximately US$ 10,000 for a simple system to more than US$ 50,000 for a more complex organization and the development of a full EMS. Analyses have shown that the cost of setting up an EMS can range from US$ 300 to more than US$ 1,000 per staff member. A phased approach can also help in reducing costs.

A full EMS requires an appreciable commitment of operational resources that an organization can reduce through the implementation of discrete steps, starting from a basic, simple procedure and becoming more comprehensive and sophisticated as capabilities enhance and resources allow. Once the basic EMS is in place, it is possible to carry out a gap analysis and to make a balanced judgment on the costs and benefits of seeking certification.

Business Support. Local business support organizations may provide the needed technical assistance for the development of EMSs. Another effective approach for businesses that are involved in supply chains for a larger business partner is entering into a mentoring agreement with that partner. There are several examples of large organizations having helped their contractors and suppliers to develop an EMS in order to achieve a green supply chain with clear benefits for both parties.

Advantages and Limitations of Environmental Management Systems

Environmental Performance. Through the systematic approach of an EMS, an enterprise can define and implement the organization’s environmental policy, ensure compliance with relevant environmental legislation and regulations, identify and manage its environmental impacts, and achieve continual improvements in environmental performance. If an enterprise adequately designs and sizes its EMS for the scale of the business’s activity, then the EMS’s implementation will allow management to understand and track its environmental performance, and thereby develop and adopt measures to improve such performance.

Compliance Awareness. An EMS dictates that an organization not only understands the regulatory framework in which it operates, but that the organization incorporates these specific requirements into the controls developed to manage specific tasks and risks. Adoption of an EMS can enable organizations to collect data that they did not previously have. Examples would be water use, energy consumption, and volume of waste generated. Additionally, these data can assist in responding to regulators as well as to markets. The challenge occurs, particularly in developing or transitional countries, when the environmental regulatory framework is still immature or under development. An important benefit of an EMS is its capacity to help improve an organization’s performance in developing countries where the regulatory framework and other drivers may not be as robust.
Economic Performance. An effective EMS reviews and sets improvement programs linked to impacts associated with resource consumption. An enterprise can make tangible savings quickly and visibly in this area. Simple, low-cost housekeeping measures systematically implemented through the adoption of an EMS can reduce costs such as those for energy, fuel, water, raw materials, wastewater treatment, and waste disposal. Quantification of economic performance improvements due to the implementation of EMS is difficult; however, these improvements are significant.

Trade Opportunities. Environmental and social performance may indeed become an important commercial factor, either as a positive attribute or as a potential trade barrier (see box 1). The implementation of an EMS is a way to demonstrate an acceptable level of environmental commitment, which in turn can assist with extending or developing new trade opportunities or markets, as well as reputational enhancement within the marketplace.

The significant growth in the number of EMS certified to standards such as ISO 14001 across the globe suggests that enterprises are using these standards to harmonize competition on the world stage and provide opportunities to trade with organizations in the developed world. The export performance of businesses in developing countries can benefit from a level playing field, especially where in-country market forces may account for lower operational or human resource costs. Enterprises can use an EMS as a vehicle for competitive advantage within the ethical and environmental products market.

Multinational corporations with operations or procurement processes within developing countries are keen to ensure that their supply of products and services is via a defined corporate responsibility path, and meets their quality and environmental standards. This typically involves the evaluation of potential contractors’ and suppliers’ environmental performance before awarding contracts, with good scores given to those that demonstrate the adoption of an EMS. Procurement routes more and more often use internationally recognized EMS standards as a shortcut or prerequisite to procurement decisions.

Changes in Environmental Attitudes and Environmental Awareness. Effective communication is fundamental if an organization is to adequately engage with the local communities and obtain a social license to operate. Core elements of an EMS, such as
training and internal communication on environmental performance, have a positive effect on employee motivation and build the organization’s reputation as a good employer, with positive impacts on human resources management and quality. The commitment to continual improvement in environmental performance sends a strong message to important external stakeholders, such as local authorities, regulators, and the local community, that the enterprise uses good practices and is a good corporate citizen.

Effective external communication mechanisms serve to meet requirements of the international financiers’ community, prevent and address community concerns, reduce risk, and assist larger processes that create positive social change. Finally, an organization’s communication that it is implementing an EMS is important to investors and shareholders to reassure them about legal compliance, against reputational risks, and to enhance the brand image of the organization’s products and services.

**Risk and Liability Control.** Financial advantages may include potential lower costs for insurance coverage for pollution incidents, and better control to minimize potential liabilities and fines. Minimizing or eliminating pollution incidents through the design and implementation of effective controls helps reduce risks and liabilities (for example, those deriving from contaminated land). This may increase the attractiveness of the organization as a low-risk investment. Conversely, poor environmental management practices have the potential to reduce overall asset value because of remediation or liability issues.

**Time Commitments.** Some private businesses, and especially SMEs, may consider a formal EMS to be too complex and time-consuming and that it generates too much documentation. However, the data necessary to demonstrate environmental compliance and performance are often already being collected and reported to regulatory authorities. Enabling performance data to flow to management and having periodic reviews of performance by top management give management better control over how a business progresses towards its objectives. In turn, better knowledge and control allow improved efficiency by helping lower operational costs and strengthen the organization’s financial sustainability.

It must be noted that an EMS (certified or not) does not guarantee good environmental performance. The EMS is a framework to approach environmental management in a systematic way, but it does not imply good environmental management in itself, and certification is about adherence to procedures, rather than good performance and adherence to the spirit. The desirable approach would be for management to make a commitment to specific environment performance improvements within a defined period and then use the EMS standard as the mechanism for demonstrating that it is complying with that commitment.

**Interaction with other Tools and Possible Substitutes**

While traditionally focused on the identification and management of environmental impacts, the EMS
Guidance Notes on Tools for POLLUTION MANAGEMENT

framework has recently expanded to include social impacts, hence creating Environmental and Social Management Systems (ESMS). Further, because of the commonality of processes, organizations may also integrate EMS with management systems utilized for other disciplines particularly Occupational Health and Safety (OHS), thereby creating occupational health and safety and environmental management systems (HSEMS), and occupational health and safety, environmental, social, security and quality management systems (HSESSQ MS).

Additionally, organizations should note that the EMS approach is robust enough to enable integration with Cleaner Production Methods. Both EMS and cleaner production are organization-wide concepts addressing all aspects of the organization’s operations, from use of natural resources to product disposal. While EMSs are the systems for an organization to identify, develop, and control its pollution prevention and abatement options, cleaner production options and tools make more efficient use of resources such as raw materials, energy, and water along a company’s value chain. This reduces waste and saves companies money on direct input and clean-up costs (see box 2). Many cleaner production investments also reduce emissions, which benefits surrounding communities.

Box 2. Clean Production Assessment as a Part of an EMS

A company in Dar es Salaam, Tanzania, is a private undertaking with 45 permanent staff members and 20 seasonal employees. It manufactures five tons of bar laundry soap per hour. The company makes soap from fat through a saponification process utilizing caustic soda. The principal source of process energy is steam generated from the combustion of industrial diesel oil in the boiler furnace burners. The company uses steam throughout the whole process and for handling materials (such as unloading of fat from truck tankers, and fat storage heating). The Cleaner Production (CP) assessment revealed leakages of steam from some of the valves and inefficient use of steam. The unloading of fat delivered to the factory resulted in spillage of 3,000 kg annually. The soil absorbed the spilled fat. The solutions identified to conserve steam energy and curb spillage of raw material allowed reducing the boiler furnace consumption of industrial diesel oil by 54 percent to only 30 liters per ton of laundry soap produced, saving 415,800 liters per year. This measure also resulted in a considerable decrease in the emission of CO₂, SO₂, and NOx. The recovery of spilled fat also made a significant improvement to the direct environment of the factory. The only option that needed some investment was the installation of steam valves, which cost US$ 830. All steam-saving measures together resulted in annual savings of US$ 185,700. The payback time was only two days. Recovery of the spilled fat requires virtually no energy input, creating a savings of US$ 2,400 per year. (See further details in IFC SME Toolkit.


other private-sector systems such as those linked to quality management, occupational health and safety and social impact management, accountability, and performance.

Public Involvement. There is considerable evidence that an informed public has a strong influence on the environmental performance of industrial enterprises. Communicating out the key objectives and policies of
the EMS, and its performance, on a regular basis is invaluable. Public release of the main environmental information from an EMS can also be a central component of a community relations program, although this goes beyond the basic concept of an EMS. The World Bank’s three Guidance Notes on Promoting Active Citizenry, including the one on Advocacy and Participation in Decision-Making can serve as a resource.

**International Standards.** An EMS may use the framework of a number of internationally recognized standards including the ISO 9000 series, the ISO 14000 series, specifically ISO 14001 and ISO 14004, and the European Eco-Management and Audit Scheme.

**Practical Examples of Environmental Management Systems and Lessons Learned**

**Russia.** One of the largest regional banks in Russia, serving both large corporations and SMEs, developed an SEMS based on IFC’s Exclusion List, project categorization, and applicable local environmental laws and regulations. During appraisal of new loans, the bank uses environmental impact assessment and site visits to evaluate social and environmental criteria of funded projects and takes on environmental liability insurance. The bank also routinely carries out consultations with clients on social and environmental risk management and, with participation of local social and environmental authorities, assists in developing an action plan to mitigate and monitor the identified risks.

**Zimbabwe.** A company operating two sugar refineries in Zimbabwe with a yearly production of 140,000 tons of refined sugar and employing approximately 500 people faced high surcharges when its water consumption level exceeded the allocated amount. In response, the company identified water conservation measures. The company projected that these measures would reduce its water consumption by approximately 86,000 m³ annually and reduce its solid wastes by 120 tons per year. The factory invested US$ 28,000 for the reduction of water consumption. With an expected saving of US$ 24,000 per year on water charges, payback period was calculated to be 14 months, not considering any possible surcharges for which the company may have been responsible. See further details in http://www.smetoolkit.org/smetoolkit/en/content/en/279/Creating-an-Environmental-Management-System-EMS.

**References and Resources on Environmental Management Systems**


The following are examples of accepted international standards for formal environmental management systems:

dex_en.htm/. (EMAS - Eco-Management and Audit Scheme (European Commission) - EU voluntary instrument which acknowledges organizations that improve their environmental performance on a continuous basis.)


Guidance and certification support can be obtained from several certification bodies and from national accreditation bodies.


Example of support toolkit, especially designed to support SMEs in implementing an EMS, can be found at the following websites:


A training kit in EMS, prepared by the United Nations Environment Programme (UNEP), the International Chamber of Commerce (ICC) and the International Federation of Consulting Engineers (FIDIC), is available from the following websites:


An article providing basic information on how an SME can implement an EMS is:


A good summary of the pilot project on adoption of EMS in SMEs in Mexico, mentioned in this paper, is provided in Chapter 7 of:

Blackman, A., ed. 2006. Small Firms and the Environment in Developing Countries.
Guidance on the requirements relevant to the social and environmental management systems is available in the Guidance Note 1 of IFC Performance Standard 1: Social and Environmental Assessment and Management System:

Cleaner Production

Introduction

UNEP DTIE (United Nations Environment Programme, Division of Technology, Industry and Environment) coined the term “Cleaner Production” (CP) in 1989 as “…the continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase overall efficiency and reduce risks to humans and the environment” (UNEP 2011). Cleaner Production principles, which are also practiced as waste minimization, pollution prevention, and eco-efficiency, are founded on the four Rs: Reduce, Recycle, Reuse, and Reformulate. This paper is written from the perspective of the private sector and is to complement a separate paper written for the public sector.

CP can be applied at all decision-making levels in industry. However, the chief focus is the adoption of cleaner technologies and techniques, and is applicable to a wide range of sectors (for example, industry, infrastructure, housing, and hospitality services) and organization sizes (from a large petrochemical plant to a small industrial enterprise). Costly end-of-pipe pollution control systems are gradually replaced with a strategy that reduces and avoids pollution and waste throughout the entire production cycle, starting with product design, and then moving to manufacturing issues such as efficient use of raw materials, energy, and water. It is an especially effective measure for climate change mitigation because of its potential to reduce greenhouse gas (GHG) emissions. Table 1 gives examples.
Table 1. Examples of Cleaner Production

<table>
<thead>
<tr>
<th>CP Actions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>A reduction in the quantity of material or energy consumed in manufacturing a unit of product</td>
<td>Certain forging techniques reduce the amount of material required to make the product while also reducing machining energy and waste</td>
</tr>
<tr>
<td>A reduction in the hazardous material required to extract a unit of mineral in metallurgical processes</td>
<td>Pre-aeration of ore in water increases efficiency of gold extraction, thereby reducing the use of cyanide</td>
</tr>
<tr>
<td>A reduction of materials used in a product</td>
<td>Lightweight bottles and small caps for water bottles</td>
</tr>
<tr>
<td>A reduction of air emissions, wastewater, and solid waste generated in production of a unit or product</td>
<td>Resource efficiency as pollution prevention, as in the case of recycling water to achieve zero discharge</td>
</tr>
<tr>
<td>A reduction of water and energy use in hospitality services</td>
<td>Water-efficient showers and toilet appliances; low-energy illumination</td>
</tr>
<tr>
<td>A reduction of energy use in low-income housing by using green building design</td>
<td>Energy-efficient orientation to maximize the amount of light entering housing units, and shading to minimize use of A/C</td>
</tr>
</tbody>
</table>

CP emphasizes both energy and resource-efficiency improvements, and many of the requirements relating to organization, data, and best practices are the same for both. CP results in benefits for all parties; it protects the environment, the consumer, and the worker while improving industrial efficiency, profitability, and competitiveness.

Description and Application of Cleaner Production

The CP process is an ongoing campaign with continuous benchmarking of performance and improvements, consisting of the following steps (see figure 1):

- Identify (and quantify) opportunities to reduce, reuse, and recycle resources, and to set cleaner production goals.
- Conduct a CP assessment.
- Develop an implementation plan based on the CP assessment.
- Implement the actions of the plan.
- Identify further CP opportunities through new performance benchmarking.

- Benchmark current resource usage through use of input-process-output analysis.
Changing an organization’s culture is rarely easy, and overcoming this barrier can be a significant challenge. When implemented within a total corporate sustainability or social responsibility commitment, CP helps to generate waves of innovation that reach beyond the immediate confines of the CP performance objectives.

At first, companies naturally focus their sustainability strategies internally. This is where they have most control, can get the quickest results, and see the direct bottom-line benefits. However, as they assess their total environmental footprint and examine the total flow of resources in the entire chain of economic activity in which they operate, many learn that much of the company’s footprint results from what they buy or sell outside their own operations. These “upstream” activities refer to the entities that supply products, materials, or services to the company that is assembling either an intermediate or a final product. Where a company sits within the supply chain will often affect its motivation and ability to take actions to improve CP performance among its suppliers.

In some ways, best practices in supply chain CP resemble those applied to internal operations strategies. Leading companies will often offer their efficiency expertise to their suppliers, essentially to support replication of those practices. However, expanding into the supply chain creates substantial new challenges in data collection, analysis, normalization, and reporting. Supply chain efforts are typically much newer, taking formal shape only in the last few years for many companies; these efforts are still in developmental stages for many others. Two key prerequisites apply: (1) the company must both learn how to run an internal CP program and demonstrate its commitment by mounting an effective internal operations effort; and (2) the company must work hard to communicate with its suppliers, explaining why it is asking for data and subsequent commitments, and showing them the benefits of their efforts.

Many companies are improving the energy efficiency of their products and services. Several companies have estimated the energy or carbon footprint of their products and services (the total carbon emissions from products and services over their useful life). Key drivers motivating companies to develop and market more energy-efficient products include pressure from public agencies and advocates, competition, and the push for higher revenue and profit.
There is no single ideal organization chart for successful CP strategies. In fact, the most practical programs seek to fit the CP mission and organization to the company’s structure and culture, rather than create a separate organization.

The one common feature of effective CP organizations is that they involve all key functions and operating units in the company. These organizations typically have someone who is identified as the corporate CP/energy manager or CP/energy team leader. They may operate out of environmental health and safety, sustainability, engineering, or operations units. The locus of the team leader is not as important as the way the team is built across functions and operating units. Effective CP team structures are typically cross-functional, multi-level, and matrixed.

When the unit making equipment-purchasing decisions differs from both the unit paying the bills and the facility operations unit, then the barrier known by economists as the “principal-agent” problem stymies CP performance. Companies determined to break through this barrier succeed by building a program that brings these agents together to pursue a common objective. They connect procurement policies with billing systems with facility operations and investment decisions. The motives of all organizational units are aligned under a single goal: meeting and beating the company’s performance targets.

Most CP investments are small, and when considered individually can be hard to notice, compared to the many larger investment opportunities corporate leaders entertain. Winning CP strategies that assess and assemble the potential for savings across multiple facilities and projects can show senior management the total bottom-line value of these investments. This can bring to light ideas that astute individuals may have known about for years, but only when the program made them visible in a meaningful way to senior management do they become actionable.

Prerequisite Factors for Cleaner Production

Champion. A visible ‘champion’ at management level is a key requirement for a successful CP campaign. The team identifying and implementing CP projects should be comprised of different stakeholders including company experts, external consultants, representatives from shop floor, engineering, finance and management. The campaign must create the necessary tools with rewards, recognition, and incentives to encourage all staff to participate in identifying opportunities and implementing changes in process. A clear communication of the program and all its benefits to the employee, the community, the company, and the environment is essential.

A report sponsored by the Pew Center summarizes the core elements of the best corporate energy efficiency strategies into “Seven Habits” of core practices and principles, cutting across internal operations, supply chains, and products and services (see box 1). Though the study was focused on energy efficiency, its results and conclusions apply more generally to CP.
Collecting and reporting data is a critical element of any corporate CP strategy. In many organizations, key CP information such as energy and water data simply are rolled into larger operating cost categories, and thus cannot be seen as separate elements. A corporate CP program requires an organization-wide system that tracks units of consumption as well as cost. A standardized set of units is needed to create a consistent basis for performance measurement.

To be useful as a performance metric, resource use is typically normalized by one or more factors the organization considers critical to its overall performance. Normalized energy data is typically expressed as "kWh per X" (kilogram of product, square meter of floor space, or product unit, among others). Beyond normalizing resource use, effective systems also develop baseline usage, typically expressed as performance in a specific year. This baseline becomes the basis of target setting, and then of measuring progress against the target.

Effective systems must measure performance against goals in regular reporting cycles with data viewed by senior executives with decision-making authority. Facility-level staff must be supported with project data or operating checklist guidance to maintain or improve performance. However, simply reporting information is not enough. Effective programs encourage direct and specific feedback, so that leaders not only see performance information, but also have practical channels through which they can act. Additionally, leaders must know whom to contact in case of a lagging facility or other operating unit.

The best CP programs do not treat their data collection and reporting systems as just a compliance requirement, although they also find that an element of compliance is needed to get broad participation, especially at first. Rather, they tap into a broader cultural ethic of continuous improvement, using the reporting system as a tool that empowers people to seek new efficiencies and associated innovations.
Advantages and Limitations of Cleaner Production

Advantages. The most compelling benefit of CP is in reducing operating costs and improving productivity for a company. It provides an economic justification for making physical and environmental improvements to a product or process, and it may act as a trigger for innovation at strategic level. In many cases, it enhances market access and prevents market exclusion. Often it serves as a proactive approach to forthcoming legislation.

CP investments provide bottom line value. Companies have found that well-crafted CP investments are highly cost-effective, with rapid paybacks and competitive rates of return, frequently at low cost and usually with low risk. Thus, CP investment decisions are often viewed in simple terms through metrics like “simple payback,” the ratio of annual energy savings to investment costs. Three-year paybacks are about as far as most companies are willing to go. While companies still use simple payback (Pew Center survey respondents averaged 28 years; see Prindle 2010), and other analyses like Internal Rate of Return (IRR) (Pew Center survey respondents averaged 18.5 percent IRR), the best CP strategies today often take other factors, or co-benefits, into account. These co-benefits are summarized in figure 2.

CP investments provide reputational value. Companies are finding that CP, eminently measurable by sustainability indicators, can quickly lead to documented accomplishments that increase reputational value among employees, investors, and other stakeholders.

As the emphasis on water scarcity, climate change and carbon emissions becomes a larger part of the sustainability equation, the fact that energy and water consumption accounts for the majority of most companies’ measured footprints means that CP’s importance as a sustainability indicator will likely continue to rise.

Figure 9. Survey Results: Co-benefits of Cleaner Production (Energy Efficiency) Investments

Source: Prindle 2010.
CP brings top-line benefits: efficiency-driven innovations not only reduce operating costs, they can also drive business growth opportunities. Some companies apply the technologies and practices they innovate internally to their customer offerings, gaining a double stream of benefits.

**Limitations.** Barriers arise from a combination of the following factors, any of which can impede the uptake of CP:

- Companies’ lack of focus on CP.
- Lack of awareness of cost savings from CP and hence reluctance to invest upfront costs.
- Lack of technical ability to identify CP projects and develop these into profitable projects.
- Perception of risk of implementing a technology that may be outside the industry norm.
- Lack of access to finance, although many CP investments require relatively modest sums.

The core of the difficulty lies in the intertwined problems of perceived high risk driving up implicit discount rates associated with projects, high transaction costs, and difficulties in structuring workable contracts for preparing, financing and implementing CP investments. With their main financial benefits focused on savings of energy costs, these cost-saving projects rarely rank as equals with projects to expand production or capture new markets, especially in rapidly growing economies.

Finding capital is the top-rated obstacle to progress in advancing CP programs. Perhaps the single most effective approach that companies have used to improve access to capital is setting aggressive efficiency goals, making them a priority, and forcing the organization’s decision makers to reset their investment priorities to favor efficiency. Many companies have found ways to help efficiency projects are approved as a strategic goal, even when conventional financial analyses make them appear less favorable than other investment options.

**Interaction with Other Tools and Possible Substitutes**

Opportunities to implement cleaner production can occur at the pre-operational phase or at any point during the project life, at the design stage, or as a retrofit of an existing process. In practice, the greatest gains to be had from cleaner production can be achieved at the earliest stages, as retrofitting is usually more difficult and expensive. However, potentially valuable opportunities are present in existing situations. There are many sources for CP opportunities, which may result from continuous improvement programs such as six sigma and lean manufacturing, as well as from industry standards, product and process engineering groups, and through technical development and research.

**Practical Examples of Cleaner Production**

**Mexico.** Vinte Viviendas Integrales is a mid-sized vertically integrated housing developer targeting the
medium- and low-income segments of the population in several cities in Mexico. Vinte housing estates feature low-energy lights and solar water heaters. In various estates, Vinte is also installing a photovoltaic system for lighting in common areas and a telemetric system to help owners optimize the use of waste, gas and electricity.

Turkey. Assan Demir, the largest player in the Turkish aluminum sheet, coil, and foil industry, implemented CP projects to improve energy efficiency and product yield at its Tuzla plant. The company invested $4 million in capital mainly for reducing heat loss in the melting and casting furnaces, and recovering waste heat. Expected benefits include a 6 percent improvement in energy efficiency. Assan also replaced a degreasing machine with a new-generation machine that uses hot water instead of chemicals, thereby reducing environmental impact and improving the quality of the strip.

References and Resources on Cleaner Production

References


Journal of Cleaner Production. Elsevier. www.elsevier.com


UNEP (United Nations Environment Programme). http://www.unep.org/resources/business/Focus_Areas/


Resources

The Canadian Industry Program for Energy Conservation (CIPEC), sponsored by Natural Resources Canada (NRCan), has developed a benchmarking and best practices program for Canada’s industrial sectors. The program helps industry achieve significant energy efficiencies. http://oee.nrcan.gc.ca/industrial/technical-info/benchmarking/benchmarking_guides.cfm?attr=24

ChemAlliance.org: “Nuts and Bolts of Chemical Process Pollution Prevention” ChemAlliance provides information concerning the environmental regulations affecting the chemical industry. ChemAlliance is operated by a partnership of environmental professionals in academia, government, and industry. The “Nuts and Bolts of Chemical Process Pollution Prevention” presentation provides practical strategies for preventing waste and reducing energy consumption in chemical manufacturing facilities. The examples are drawn from more than 400 case studies contained in the ChemAlliance Virtual Plant Tour. http://www.chemalliance.org/Presentations/nuts_and_bolts_p2/index.asp
EPA South Australia (EPA SA) CP Case Studies

European Bank for Reconstruction and Development (EBRD)
The EBRD’s energy efficiency and climate change team works to develop energy efficiency and renewable energy credit lines, to promote energy efficiency in public buildings and industries, and to build a carbon-credit market in the countries of operations. [http://www.ebrd.com/index.htm](http://www.ebrd.com/index.htm)

European Integrated Pollution Prevention and Control (EIPPC) Best Practices
The European Integrated Pollution Prevention and Control Bureau (EIPPCB) was set up to organize an exchange of information between Member States and industry on Best Available Techniques (BAT), associated monitoring, and developments within them. The European IPPC Bureau is an output-oriented team that produces reference documents on Best Available Techniques, called BREFs. BREFs are the main reference documents used by competent authorities in Member States when issuing operating permits for the installations that represent a significant pollution potential in Europe. There are about 50,000 of these installations in Europe. [http://eippcb.jrc.es/reference/](http://eippcb.jrc.es/reference/) [http://eippcb.jrc.es/pub/english.cgi/0/733169](http://eippcb.jrc.es/pub/english.cgi/0/733169)

Quick PEP Software Tool
The Quick PEP Software Tool is one of the software tools developed by the US Department of Energy Industrial Technologies Program to help US industry improve energy management at industrial facilities. The software is a web-based tool and is available free of charge from this Web site. This Web page provides an overview of the Quick PEP Software Tool, including intended users, inputs, outputs, availability, and links to more information.

Regional Activity Centre for Cleaner Production
This center based in Barcelona is one of the six Regional Activity Centres (RACs) within the Mediterranean Action Plan (MAP). Each one of these centers is responsible for a specific thematic area. The main goal of the RAC/CP is the promotion and dissemination of prevention, and the reduction of pollution at source in the industrial, agriculture, and tourism sectors. The RAC/CP is situated in the city of Barcelona (Spain). [http://www.cprac.org/eng/01_presentacio.htm](http://www.cprac.org/eng/01_presentacio.htm)

RAC Studies (English, French, and Spanish)
This resource offers a detailed analysis of an industrial sector, and shows its situation and trends in each of the Mediterranean countries. These studies are a tool to encourage the implementation of eco-efficiency in industries. They describe production processes and their environmental impact, while proposing feasible pollution prevention options. [http://www.cprac.org/eng/03_activitats_estudis_03.htm#13](http://www.cprac.org/eng/03_activitats_estudis_03.htm#13)
[Database of Consultants compiled by RAC](http://www.cprac.org/eng/03_activitats_bbddsectorials_01.htm)

RETScreen International Clean Energy Decision Support Centre
The RETScreen center seeks to build the capacity of planners, decision-makers, and industry to implement renewable energy, cogeneration, and energy efficiency projects.
This objective is achieved by: developing decision-making tools (that is, RETScreen Software) that reduce the cost of pre-feasibility studies; disseminating knowledge to help people make better decisions; and by training people to better analyze the technical and financial viability of possible projects.

http://www.retscreen.net/ang/centre.php
http://www.retscreen.net/ang/t_training.php
http://www.retscreen.net/ang/t_case_studies.php
http://www.retscreen.net/ang/t_software.php

United Nations Industrial Development Organisation

United Nations Environmental Programme (UNEP)
National Cleaner Production Centre (UNIDO NCPC)
UNIDO and UNEP have joined forces to help introduce Cleaner Production in developing countries and countries in transition. The UNIDO/UNEP Programme for National Cleaner Production Centres (NCPCs) is a unique program of capacity development to help achieve adoption and further development of the Cleaner Production concept at the national level.

www.unido.org/index.php?id=o5133

Best Practices Case Studies
http://www1.eere.energy.gov/industry/bestpractices/case_studies.html
The U.S. Department of Energy (DOE) Save Energy Now Program
http://www1.eere.energy.gov/industry/saveenergynow/

US EPA ENERGY STAR
This information center contains energy savings information tailored to industries or focused on specific plant utility and process improvements. ENERGY STAR tools and resources are also available to manage building energy efficiency.

http://www.energystar.gov/index.cfm?c=industry.bus_industry

US EPA Energy Star Energy Performance Indicators (EPIs)
US EPA has developed energy performance indicators (EPIs) for use in several industries’ production plants and operations plants. This rating tool is an external yardstick that enables you to assess how efficiently your plant uses energy, relative to similar plants in the USA. The rating system's 1-100 scale enables company personnel to quickly understand how their plant is performing. For instance, a rating of 50 indicates average energy performance, while a rating of 75 or better indicates top performance. Plants receiving an EPI score of 75 or higher in the USA are eligible to earn ENERGY STAR recognition. EPIs for Food, Glass, Petrochemicals, and Steel are still under development.

http://www.energystar.gov/index.cfm?c=industry.bus_industries_focus

EPIs are currently available for these industries:
Cement Manufacturing
http://www.energystar.gov/index.cfm?c=industry.bus_cement_manuf_focus
Container Glass Manufacturing Plants
http://www.energystar.gov/index.cfm?c=industry.bus_glass_manuf_focus
Corn Refining
http://www.energystar.gov/index.cfm?c=industry.bus_corn_refine_focus
Flat Glass Manufacturing Plants
http://www.energystar.gov/index.cfm?c=industry.bus_glass_manuf_focus
Frozen Fried Potato Processing Plants

http://www.energystar.gov/index.cfm?c=in_focus.bus_food_proc_focus

Juice Processing Plants

http://www.energystar.gov/index.cfm?c=in_focus.bus_food_proc_focus

Motor Vehicle Manufacturing

http://www.energystar.gov/index.cfm?c=in_focus.bus_motorveh_manuf_focus

Pharmaceutical Manufacturing

http://www.energystar.gov/index.cfm?c=in_focus.bus_pharmaceutical_focus

US Green Building Council

The US Green Building Council (USGBC; see USGBC Web site) is a non-profit organization committed to a prosperous and sustainable future for our nation through cost-efficient and energy-saving green buildings.

Targeting Occupational Health and Safety*

Introduction

Occupational health and safety (OHS) management protects the safety, health, and welfare of people at the workplace. In 1950, the first session of the joint International Labour Organization (ILO) and the World Health Organization (WHO) Committee on Occupational Health adopted a definition of occupational health. The definition was subsequently revised in 1995 and states:

- Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities and, to summarize: the adaptation of work to man and of each man to his job. (Guidotti 2011, 5)

All occupational health and safety programs aim to foster a safe work environment, including the protection of employers, suppliers, customers, family members, nearby communities, and other members of the public who could be affected by a company’s operations. Such programs draw on disciplines such as occupational medicine, occupational or industrial hygiene, public health, safety engineering, chemistry, health physics, ergonomics, toxicology, epidemiology, and environmental health.

Description and Application of Targeting Occupational Health and Safety

Typical occupational health and safety risks common to the industrial sectors may be categorized as physical, chemical, ergonomic, and biological risks. Slips, trips, falls, noise, and vibration are examples of physical risks. Fires, explosions, leaks, spills, and exposure to gases, vapors, mists, dust, and fumes are common chemical risks. Muscular-skeletal problems resulting from repetitive activities such as lifting and carrying, or from spending long periods in one single position such as sitting at desks and working with computers, are typical ergonomic risks. Lastly, exposure to bacteria, viruses, biogenic toxins, and allergens is characteristic of biological risks.
To address occupational health and safety, a business should identify the workplace hazards (see Appendix, page 10). A hazard refers to a circumstance that has the potential to cause harm. It may indicate a physical situation or it may indicate the omission of necessary preventative measures. An example of a physical situation would be exposure to equipment with sharp edges that could cause lacerations, while an example of an omission would be the failure to provide a guard to prevent injury from the sharp edges on the equipment.

Modern occupational health and safety legislation usually demands that a risk assessment be carried out prior to making an intervention. Risk management requires risk to be managed to a level that is as low as is reasonably practical. This assessment should detect the hazards, identify all affected by the hazards, evaluate the risk, and offer and prioritize appropriate control measures.

The evaluation of risk is based on the likelihood or probability of the harm being realized and the severity of the consequences. This can be expressed mathematically as a quantitative assessment by assigning integers to denote low, medium, or high likelihood, and assigning integers to indicate the severity of the consequences. The integer assigned for likelihood and the one assigned for severity can be multiplied together to obtain a risk factor. Risk can

<table>
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<tr>
<th>Box 1. Typical Risk-Control Hierarchy</th>
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<tr>
<td><strong>Avoid the risk</strong> – this is ideal, but not always attainable.</td>
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<tr>
<td><strong>Replace the dangerous with the less dangerous</strong> – for example, replace hazardous materials with safer alternatives.</td>
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<td><strong>Prioritize the risk</strong> – focus attention on the greater risks, including those where the public is involved.</td>
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<td><strong>Control hazards at their source</strong> – deal with the hazard directly, do not use a secondary control; for example, control noise by repairing or maintaining the machine, not by using hearing protectors.</td>
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<td><strong>Adapt work to individuals’ abilities</strong> – for example, use stronger people for tasks demanding strength.</td>
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<td><strong>Upgrade work equipment as technology improves</strong> – newer equipment may be marked to show that it meets tougher safety standards.</td>
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<tr>
<td><strong>Implement a coherent control policy</strong> – ensure that the specific risk control does not cause a disproportionate problem elsewhere; for example, do not solve the problem of a noisy machine by relocating it.</td>
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<td><strong>Ensure that collective measures have priority over individual measures</strong> – for example, it is better to provide a safety roof rather than to rely on individual measures such as hard hats.</td>
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<tr>
<td><strong>Inform, instruct, train, and supervise</strong> the workforce.</td>
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<tr>
<td><strong>Provide Personal Protective Equipment (PPE).</strong> Although PPE is often essential, all the higher level controls should be considered first before using PPE as the alternative to solve a problem. Appropriate PPE (for example, overalls, safety boots, gloves, and hard hats) should be required even in the safest environments.</td>
</tr>
</tbody>
</table>
also be evaluated qualitatively by describing the circumstance in which the harm could arise. Newly introduced controls should lower risk by one level (for example, from high to medium or from medium to low). Risk increases as the seriousness of resulting harm increases, and as the likelihood increases that the circumstance will occur. Ideally, all risks would be mitigated; however, this is usually not feasible. Box 1 lists a typical risk-control hierarchy.

Implementing an occupational health and safety management system, which can be carried out in-house or by specialized consultants, is a reliable way of improving occupational health and safety performance in the workplace. These health and safety systems promote, facilitate, and enable consistency throughout workplace activities and processes. It is important to note that the system alone will not produce safe behavior or a safe workplace. System effectiveness comes from complete commitment to the health and safety system. This includes proper implementation, follow-up, and training.

**Behavior-Based Safety.** Behavior-based safety (BBS) is an approach used to reduce workplace accidents and fatalities. It is set on the premise that safety in the workplace is a combination of three measurable components: personality, environment, and behavior. Only when these three elements are combined can the workplace be “accident free.” BBS argues that by observing and analyzing the interactions between people’s behavior and the work environment, it is possible to identify factors that support safe or unsafe behavior. BBS also maintains that by changing the environment to support safe behavior and implementing proven behavioral safety processes, a business can dramatically reduce the number of lost-time and minor injuries.

Advocacy for behavior-based safety has also stimulated controversy, with some arguing that a behavioral focus puts excessive responsibility on the workers, and that BBS is too limiting and should aim for a more holistic or culture-focused approach. In any case, behavioral safety has provided a platform for constructive debate, and the conflicting opinions have provided the opportunity to learn more about the psychology of injury prevention (Cooper 2007; Geller 2004).

To be successful, the BBS program must include all employees from the CEO to the most basic job position, since the changes needed cannot be accomplished without buy-in and support from all involved in making those decisions. Central elements of a BBS program include (a) common goals for the employees and the managers, (b) behavioral observation and feedback processes, (c) formal review of observation data, (d) improvement goals, and (e) reinforcement for improvement and goal attainment. Other aspects that can contribute to a BBS program’s success include (a) multilevel teams for the assessment phase, the observation and the review phases, or for all three phases; (b) placing the focus on site observation; and (c) recognizing that BBS is not a quick fix, but rather a commitment to a safer environment and injury reduction.

**OHS Application in Small and Medium-Sized Enterprises.** Small enterprises are commonly defined as having 1–49 employees and medium-sized
enterprises as having 50–249 employees. As key drivers in the world economies, small and medium-sized enterprises (SMEs) need to have their safety and health performance on a par with that of larger companies. If an SME did not understand its health and safety risks, then it would lack the knowledge to manage its health and safety performance, and as a result may not assign needed resources to provide adequate training.

Typical occupational health and safety management for SMEs includes the following: meeting legal responsibilities, establishing an organizational health and safety structure, developing a written health and safety policy, assessing risks, training the workforce, consulting with the workforce, monitoring and improving safety performance, and providing safe facilities. The requirements for the safe environment of an SME are not different from those for any other business. However, the economic impact of an accident is more severe on a SME than on a big company, since an SME has less working capital. Mechanisms to overcome SMEs’ occupational health and safety issues might include organizing to obtain collective training from the government, or participating in sector-specific OHS initiatives.

**Practicalities of implementation.** It is a good business practice for all operations, regardless of size, to have an occupational health and safety management system commensurate with their risks. However, implementing such a system may involve costs that businesses had not anticipated and may be unwilling to bear. Businesses should quantify the costs associated with accidents that cause harm to people or property. Deciding whether to allocate resources to develop an occupational health and safety management system should be based on the system’s potential to reduce the human cost of physical harm and the financial cost of the accidents, in relation to the costs associated with the management system.

Sometimes, the lack of clear health and safety regulations may hinder the implementation of management systems. In such cases, it is a good business practice to refer to established sector-specific benchmarks for good health and safety practices, and established occupational health and safety regulations from other regions.

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**Box 2. Basic Elements for Good Health and Safety Management Systems**

- **Management Commitment and Employee Involvement.** The manager or management team leads the way by setting policy, assigning and supporting responsibility, setting an example, and involving employees.

- **Worksite Analysis.** The worksite is continually analyzed to identify all existing and potential hazards.

- **Hazard Prevention and Control.** Methods to prevent or control existing or potential hazards are put in place and maintained.

- **Training for Employees, Supervisors and Managers.** Managers, supervisors, and employees are trained to understand and deal with worksite hazards.

- **Follow-up.** To determine what is working well and what changes are needed.
If the workforce has low literacy or educational levels, and/or lacks the appropriate skills set (for example, farmers becoming factory workers, and women or youngsters becoming part of the labor force), it is highly advisable that businesses focus additional efforts to train the labor force so as to minimize the likelihood of accidents and unsafe working conditions.

In a few circumstances, cultural beliefs may prevent some health and safety controls from being applied (for example, in the United Kingdom, Sikhs required an exemption from the regulation that drivers of motorcycles wear crash helmets). Where such constraints occur, it is especially important that technical solutions are found to minimize health and safety risks in the workplace.

**Prerequisite Factors for Targeting Occupational Health and Safety**

New businesses sometimes fail to include occupational health and safety within their management priorities. Thus since management may not carry out early identification and proper assessment of health and safety risks, it cannot make its employees aware of the workplace risks, and training programs may not be properly established. New businesses should begin addressing health and safety from day one (see box 2).

Open communication with the employees is crucial to the success of an occupational health and safety system. The employees’ cooperation depends on their understanding of the system’s goals, why it is important to them, and how it affects their work.

Additionally, documentation of the activities in all elements of the safety and health program is important. Essential records, including those legally required for workers’ compensation, insurance audits, and government inspections, must be maintained as long as the actual need exists or as required by law. Keeping records of all activities, such as policy statements, training sessions, safety and health meetings, information distributed to employees, and medical arrangements made, is greatly encouraged.

Maintaining essential records will demonstrate sound business management as supporting proof for credit applications, for insurance and other audits. Furthermore, such records help in the review of ongoing safety and health activities for better control of current operations and to plan improvements. Records of accidents, related injuries, illnesses, and property losses are essential to developing procedures to prevent recurrence.

Any good management system requires periodic review to determine what is working well and what changes are needed. A widely accepted way to identify hazards is to conduct safety and health inspections. Using checklists is a good way to get an indication of where to begin taking action towards a safer and more healthful business. The self-inspection checklist in Appendix 1 includes a basic, but not exhaustive, list of areas to be considered when assessing health and safety risks.
Advantages and Limitations of Targeting Occupational Health and Safety

Businesses may establish good occupational health and safety systems for ethical reasons, to realize economic benefits, and/or to satisfy legal requirements. Economic benefits are secondary to human health and safety as a rationale for health and safety protection. However, businesses may consider calculating the total (direct and indirect) costs of work-related injuries and illnesses to determine the economic benefits that may achieved by preventing injuries and illnesses. Conversely, businesses may recognize the economic disadvantages of poor occupational health and safety performance in terms of lost productivity, and the requirements to pay compensation and fines.

When operating with appropriate occupational health and safety systems, businesses may recognize that these systems improve staff performance and availability for work, help in recruiting and retaining key skills and expertise, avoid possible disability discrimination, reduce workers’ compensation insurance costs and medical expenditures, and produce fewer faulty products. Other indirect benefits may include increased morale, better labor and management relations, reduced turnover, and better use of human resources.

Governments experience the disadvantages of poor occupational health and safety performance through lost tax revenue, through increased welfare costs for social security payments and medical treatments, and through the social costs of accidents. Governments respond through the enactment of legal instruments to enforce minimum health and safety standards.

The complexity of a business’s occupational health and safety management should be directly proportional to the business’s occupational health and safety risks. There is little to be gained from a management system that generates paperwork and takes up significant time and effort, but results in little or no risk reduction. To help businesses in identifying work-related hazards, there are commercially available software tools.

Established businesses with a good safety record may become complacent and overlook the inherent risks associated with their operations. If there is a long period with zero accidents, management might wrongly relax safety practices, assuming that the workplace is safe. Established operations should carefully implement occupational health and safety principles and closely monitor occupational health and safety performance data, including reports of near misses and incidents.

Interaction with other Tools and Possible Substitutes

There is an ongoing tendency to integrate the occupational health and safety management system with other structures typically used to manage businesses successfully. These other structures include the environmental and social management system and the quality management system. This approach allows a business to address the key aspects
of its operations through a coordinated approach by integrating all of the business’s systems and processes into one complete framework.

A good practice is to benchmark a business’s occupational health and safety performance to establish the system’s level of effectiveness. Good sources include the benchmarks published by some countries’ regulatory agencies responsible for health and safety enforcement, for example the U.K. Health and Safety Executive’s Corporate Health & Safety Performance Index (HSE Web site), the industrial trade associations, IFC environmental guidelines, the EU Best Available Technique Reference Notes (BREF), the ILO small and medium enterprise toolkits, Occupational Health and Safety Advisory Service (OHSAS) 18001:2007, the American National Standards Institute (ANSI) and American Industrial Hygiene Association (AIHA) Z10-2005, and British System (BS): 8800:2004.

Certification to the standard may confer a marketing advantage and be of commercial benefit to some businesses, particularly to satisfy the supply-chain requirements of clients that have their own occupational health and safety management system certified to the standard.

National governments may take a prescriptive approach to occupational health and safety legislation, or they may embrace the concept of risk assessment, which aims to identify hazards and implement reasonably practical measures to reduce risks to the lowest possible level. Judgments about what is “reasonably practical” include economic analysis of costs and benefits as well as consideration of the range of available technology.

Sometimes the regulatory framework combines the two approaches. In the United Kingdom, for example, while there is a movement towards risk assessment in recent laws governing asbestos and fire safety management, prescriptive legislation requires that all dangerous parts on workplace equipment be suitably guarded to prevent harm to people, if such guarding is technically possible.

Many governments have established national agencies whose role it is to carry out research, provide occupational health and safety information and training, inspect workplaces, and enforce regulatory compliance.

Good business practices would also consider the benefits of a sound occupational health and safety system from the perspective of avoiding penalties from lack of compliance with government requirements, anticipating legal challenges, and possibly benefiting from better insurance premiums.

Practical Examples of Targeting Occupational Health and Safety and Lessons Learned

**Brazil.** A large Brazilian construction company significantly reduced the number of accidents and fatalities by developing a rigorous occupational health and safety program. Key elements of this program included (a) a detailed workers toolkit identifying all job-related risks, typical accident
causes, and clear ways to prevent/avoid them; (b) rigorous and focused H&S training for managers and supervisors; (c) constant worker H&S induction and training; and (d) monetary rewards to the entire team including project manager and employees. The source of these financial incentives is the money allocated for accidents/fatalities compensation not having to be used for that purpose. The number of accidents and fatalities has been reduced below the typical benchmark for construction operations.

**China.** To motivate employees to work safely, a Chinese chemical company decided that, in addition to its standard safety procedures and practices, it would ask each employee to bring a family picture to work in order to create a family bulletin board for each work area. The board was located in the room where, each morning, the workers had a five-minute safety talk and pledged to their families to have a safe workday. After introducing these practices, management noticed that workers began talking about safety among themselves, and management credits these innovations as contributing to a reduced accident rate.

**References and Resources on Targeting Occupational Health and Safety**


NIOSH (National Institute for Occupational Safety and Health) Malaysia, “National Institute of Occupational Safety and Health (Malaysia),

This guidance note is part of World Bank Group publication: Getting to Green—A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
## Appendix: Self-Inspection Checklist

**Building and Grounds Conditions** – floors, walls, ceilings, exits, stairs, walkways, ramps, platforms, driveways, aisles

**Chemicals** – storage, handling, transportation, spills, disposals, amounts used, labeling, toxicity or other harmful effects, warning signs, supervision, training, protective clothing and equipment, hazard communication requirements

**Electricity** – equipment, switches, breakers, fuses, switch-boxes, junctions, special fixtures, circuits, insulation, extensions, tools, motors, grounding, national electric code compliance

**Evacuation Plan** – establish and practice procedures for an emergency evacuation in response to a fire, chemical/biological incident, bomb threat; include escape procedures and routes, critical plant operations, employee accounting following an evacuation, rescue and medical duties, ways to report emergencies

**Fire Prevention** – extinguishers, alarms, sprinklers, smoking rules, exits, personnel assigned, separation of flammable materials and dangerous operations, explosion-proof fixtures in hazardous locations, waste disposal, training

**First Aid Program/Supplies** – medical care facilities locations, posted emergency numbers, accessible first aid kits

**Hand and Power Tools** – purchasing standards, inspection, storage, repair, maintenance, grounding, use, handling

**Heating and Ventilation** – type, effectiveness, temperature, humidity, controls, natural and artificial ventilation, exhausting

**Housekeeping Program** – waste disposal, tools, objects, materials, leakage and spillage, cleaning methods, schedules, work areas, remote areas, storage areas

**Lighting** – type, intensity, controls, conditions, diffusion, location, glare and shadow control

**Machinery** – points of operation, flywheels, gears, shafts, pulleys, key ways, belts, couplings, sprockets, chains, frames, controls, lighting for tools and equipment, brakes, exhausting, feeding, oiling, adjusting, maintenance, lockout/tagout, grounding, work space, location, purchasing standards

**Maintenance** – provide regular and preventive maintenance on all equipment used at the worksite, record all work performed on the machinery and train personnel to properly care for and service the equipment

**Personnel** – training, including hazard identification training; experience; methods of checking machines before use; type of clothing to be worn; use of guards; tool storage; work practices; methods for cleaning, oiling, adjusting machinery

**Processing, Receiving, Shipping, and Storage** – equipment, job planning, layout, heights, floor loads, projection of materials, material handling and storage methods, training for material-handling equipment

**Provide Personal Protective Equipment (PPE)** – type, size, maintenance, repair, age, storage, assignment of responsibility, purchasing methods, standards observed, training in care and use, rules of use, method of assignment

**Transportation** – motor vehicle safety, seat belts, vehicle maintenance, safe driver programs
Sustainability in the Supply Chain*

Introduction

Supply chain management (SCM) is the process through which a company manages the sourcing and procurement of inputs, the processing and manufacture of products and services, and their delivery to the consumer (figure 1). The primary objective of supply chain management is to meet consumer demand with more efficient use of resources including labor, inventory, stock, and distribution capacity. Accordingly, supply chain management aims to integrate major business functions and business processes within and across companies into a cohesive and high-performing business model capable of quickly reacting to dynamic market demands and rapidly changing features. SCM provides opportunities through which private sector companies can extend their influence in pollution control and abatement beyond their own operations and into their supply chain. This involves coordination and collaboration with partners throughout the value chain, which can include suppliers, intermediaries, third-party service providers, and customers.

The term “supply chain” includes all organizations, activities, and processes associated with all stages of the business processes involved in the planning, sourcing, processing, manufacturing, and delivery of goods and services. This process begins with suppliers of raw materials and inputs, proceeds to processors and manufacturers, and culminates to the delivery of completed goods and services to consumers and end users. The supply chain of multinational corporations can be complex, extensive and may be global in nature, whereas the supply chain of national or smaller enterprises will be less complex, smaller in scale, and local in nature, involving only local contractors, subcontractors, and home workers. Globalization has led to increased visibility of the environmental and social (E&S) impacts associated with the sourcing and processing of raw materials. Increased visibility has led to heightened consumer awareness and increased demand that firms ensure E&S sustainability through the entire supply chain.

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The key objective of supply chain management is to increase the efficiency of the activities and processes involved in the planning, sourcing, processing/manufacture and delivery of goods and services to end consumers. Increased efficiency may be achieved across either part of or the entire supply chain and typically is associated with improved productivity, increased product quality, improved logistics and ultimately a reduction in costs. Many aspects of SCM already consider resource utilisation and cost savings. As such the inclusion of a sustainability dimension in supply chains and SCM builds on the underlying business case for SCM. Sustainability is thus becoming an integral component of supply chain management. There is no single, universally accepted definition of supply chain sustainability and it is often described in general terms through tools like responsible sourcing, green supply chains and triple value chain management (TVC), or more generically through corporate social responsibility. The application of E&S sustainability criteria to supply chains has focused on physical products such as food and clothing. This focus extends to the sourcing of raw materials, their processing, and their use in the manufacture of intermediate and final products.

**Description of Supply Chain Management**

*Description of Supply Chain Management.* A basic supply chain management system has five key components.

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**Figure 1. Generic Illustration of Supply Chain and Potential Sustainability Issues**

![Generic Illustration of Supply Chain and Potential Sustainability Issues](image)

- **Primary Source**
- **Primary Distribution**
- **Processing (Intermediate)**
- **Manufacturing**
- **Processing (Final products)**
- **Secondary Distribution**
- **Retailer**
- **Consumer**

**Potential SCM E&S Sustainability Issues**

- Labor Use
- Water Use
- Energy Efficiency
- Pollution Prevention
1) **Plan** The overall strategy of the SCM program including the development of SCM metrics for monitoring;

2) **Source** Identification, evaluation and selection of suppliers of goods and services; procurement contracting including performance guarantees and targets; and monitoring;

3) **Manufacture.** Make or manufacturing component, which refers to the execution of processes needed to produce, test, and package your products or services;

4) **Delivery.** The system for receiving orders from customers, developing a network of warehouses; getting the products to the customers; invoicing customers and receiving payment from them; and

5) **Return.** A responsive and flexible network for receiving defective and excess products back from customers and supporting customers who have problems with delivered products.

There are a number of models to help manage supply chains, such as Supply Chain Operations Reference model (SCOR), developed by the global Supply Chain Council as a cross-industry standard diagnostic tool for supply chain management. The Supply Chain Operations Reference (SCOR®) model is the product of Supply Chain Council (SCC). The SCOR model provides a framework that links business process, metrics, best practices, and technology features into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities (available to SCC members at http://supply-chain.org/). An individual firm can apply SCM across the entire sourcing – production – distribution process or to any of its components.

**Integration of Environmental and Social Criteria into Supply Chain Management.** SCM is an umbrella that encompasses the entire process from plan to sourcing to manufacture to distribution. Environmental and social sustainability criteria can be integrated into each of the five key components of SCM. For each of these components there are various E&S tools through which the firm may define, monitor and evaluate E&S performance of the SCM component (figure 2).
E&S Sustainability of Supply Chains

Supply Chain Sustainability. There is no universally accepted definition of supply chain sustainability. Specific definitions and supporting principles and criteria vary by sector and commodity. In general terms the following environmental and social issues are considered - labour use, water use, energy efficiency, pollution prevention, biosecurity, social impacts (e.g., displacement, indigenous people), loss of biodiversity, forest conversion and land use and sustainable use of living resources\(^1\).

Figure 3 illustrates a simple supply chain for an individual firm. The potential for the firm to promote E&S sustainability within its supply chain involves the following factors:

- Position of the firm within the supply chain of the product. Firms involved in sourcing of raw materials or commodities may either have direct responsibility for sourcing (for example mining) or have short supply chains which may nonetheless involve a large number of producers (for example smallholder agricultural commodities). In contrast, firms involved in the manufacture of end products have an extensive chain of suppliers involved in sourcing of raw materials, processing and manufacture of intermediate products. Market-based power to demand changes in supplier policy, behavior and product attributes is strongest with the primary suppliers of the firm.

- Various factors affect the ability of a firm to promote improved sustainability:
  - Where the introduction of sustainability considerations in the supply chain leads to mutual advantage and the costs are

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\(^1\) The IFC Sustainability Policy and Performance Standards focus on only two aspects of environmental and social sustainability of supply chains, namely labour use (i.e., use of child and forced labour) and biodiversity.
neither excessive nor disproportionate to benefits, it is more straightforward to promote E&S sustainability within the supply chain.

- Downstream enterprises requiring inclusion of E&S criteria in their supply chains may be required to invest resources in building the capacity of their suppliers to ensure that they understand and are able act upon E&S requirements. Such activities include defining and sharing industry benchmarks, identification and analysis of alternatives, and joint implementation of selected sustainability initiatives.

- Leverage refers to the ability to demand E&S sustainability performance within the supply chain. Higher leverage is associated with access to proprietary technology and knowledge, greater market share, and greater purchasing power, resulting in a greater dependence of suppliers on the end user. Where the firm has complex operations with multiple tiers of suppliers, its leverage will diminish toward the more distant tiers.

- The position of the firm at a national, regional, or global level affects its ability to bring about change within value chain.

**Figure 3. Diagrammatic Illustration of a Firm’s Supply Chain**
**Strategies and Tools for Promoting Sustainability in the Supply Chain.**

**Assessment** Ideally E&S sustainability criteria should inform development of a firm’s supply chain. This could be achieved by ensuring that E&S criteria are integrated into the process of identifying and evaluating potential suppliers. However, in recognition that, for the most part, such E&S criteria are developed and applied retroactively, the firm should conduct an assessment of its supply chain to identify key E&S issues associated with the sourcing of raw materials, commodities and intermediate products. Subsequently, the firm should assess the ease with which E&S sustainability criteria can be integrated into component supply chains. Together these assessments will inform the firm about priority risks, key areas of legal and regulatory non-compliance, and as such direct the development of supply chain policy and actions.

**Building Awareness** Definition and operationalization of a firm’s supply chain sustainability requirements vis-à-vis its supply chain may require a period of building awareness amongst key suppliers, and an appropriate transition period during which key suppliers can develop the capacity to meet requirements.

**Defining Supply Chain Sustainability Requirements** There are a range of possible requirements that a firm could require of its suppliers so as to promote E&S sustainability within the supply chain. These include:

- **Development of an E&S Policy and Code of Conduct** Key suppliers can be asked to develop and E&S policy or Code of Conduct specific to the key E&S risks and impacts associated with their operations.

- **Legal and Regulatory Compliance** As part of E&S policy development, firms typically assure compliance with legal and regulatory environment.

- **Supply and Procurement Contracts** Firms may include E&S performance requirements in contracts with their suppliers. Often such requirements include the need to adopt and implement appropriate management systems, to obtain relevant product certification, and among other things, to develop Codes of Conduct. In defining E&S contractual obligations, the firm should ensure that the length of contract reflects the type of investment needed to achieve E&S requirements. Where appropriate, the firm should also ensure that an adequate time period is provided to meet E&S requirements.

- **Requiring Certification for Established E&S Standards** There are an increasing number of globally recognized industry and commodity standards that include E&S sustainability issues. Firms may ask suppliers to adopt standards and ensure certification that operations and products comply with the requirements of the standards.
• **Requirements to Use Recognized E&S Management Systems**  Firms may ask other firms to adopt recognized E&S management systems including ISO14001, OHSAS 18001, SA8000, AA1000, and Enviro-Mark (web-based).

• **Supplier Assessment and Approval**  A firm may also require suppliers to develop their own supply chain management policy and procedures.

• **E&S Reporting**  A firm may ask its suppliers to provide reports including E&S risks and impacts and their management. This might include energy usage, greenhouse gases, disposal and recycling of waste products; water consumption; occupational health and safety; legal non-compliances and regulatory notices, and major E&S events, among others.

• **Capacity Building**  Depending on the position of the end user and the degree to which supply chain sustainability is a sector-market norm, a firm may elect to support suppliers unable to immediately meet new E&S criteria with capacity building and other resources.

• **Monitoring and Verification**  Requiring E&S supply chain sustainability is typically associated with the need to monitor and verify. Firms may assign staff to conduct regular monitoring of key suppliers or otherwise seek third party verification of E&S performance, use of management systems and compliance with the requirements of product standards.

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**Small and Medium Enterprises**

When considered individually, SMEs are not major contributors to E&S issues. However, in aggregate they represent a substantial contributor to environmental and social issues, this being exacerbated by the often limited enforcement of E&S law and regulations in the sector.

With regard to E&S sustainability of supply chains, it is recognized that small and medium enterprises (SMEs) are generally at the end of the supply chain, and as such are more likely to be subject to E&S supply chain sustainability requirements (described above) from the firms they supply. SMEs can both prepare for and increase their competitive advantage by proactively seeking to meet some of the E&S supply chain sustainability requirements. Activities might include development of an E&S management system, development of E&S policy and Code of Conduct, participation in SME for those concerned with E&S management, and inclusion of E&S reporting requirements.

Finally, requirements for E&S sustainability in the supply chain may require both time and capacity building. SMEs should seek to partner with the firms they supply to draw on expertise and resources, and partner for improved E&S performance.
Business Drivers and Constraints / Barriers of Sustainability in the Supply Chain

**Business Drivers** Additional business drivers for the inclusion of a sustainability dimension in SCM are outlined below:

- **Market Demand** Consumers are increasingly aware of and concerned with the E&S sustainability of the products they consume. This awareness and concern has translated into market pressure for producers to integrate sustainability concerns into their production and their supply chain. Market pressure is perhaps most widely recognized for agro-commodities (for example palm oil, soy, sugar, cotton, cocoa, coffee) and forest products (including timber and paper) where end users are demanding that producers source sustainably, and, where relevant, are active in the development of sustainable sources. The proliferation of voluntary commodity standards promoting sustainable production and supply chains reflects such market pressure.

- **E&S Legislation and Regulatory Requirements** Environmental and social legislation and regulatory directives may include performance requirements, material mandates, and extended producer responsibility. Substantial amounts of environmental legislation and regulations require companies to ensure supply chain compliance. Examples include US biosecurity legislation and regulations, and EU directives such as Reduction of Hazardous Substances (RoHs) 2002/95/EC July 2006; Waste Electrical and Electronic Equipment (WEEE) 2002/96/EC February 2003; and Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) June 2007. As such, the development of legislation in one region may involve new requirements that enterprises subsequently pass on to their suppliers in their supply chain.

- **Resource Scarcity and Price Volatility** As noted above, SCM is traditionally concerned with resource efficiency and cost savings, and as such many SCM activities that are common practice already include an E&S sustainability dimension. Assessment of supplier use of resources (including energy and water) and promotion of industry best practices in terms of resource use efficiency are becoming common practice.
Constraints / Barriers  Acceptable E&S supply chain sustainability requirements vary according to a number of factors; these include sector, industry, and commodity. In the vast majority of cases, a firm can promote E&S performance in the supply chain through a relatively limited and straightforward series of requirements. As the complexity of the supply chain increases and it becomes increasingly difficult to promote and verify E&S supply chain sustainability, it becomes increasingly difficult to address supply chain sustainability. Listed below are types of requirements relating to sustainability in the supply chain.

Market Supply Chain Sustainability and Existence of Standards  It is more straightforward to apply supply chain sustainability requirements in a market environment already familiar with key aspects of these requirements. Further, the existence of relevant E&S benchmarks and standards is a useful but not necessary condition for application of E&S supply chain sustainability requirements.

Defining Boundaries of Responsibility  A firm’s position in the supply chain will determine the number of its suppliers and the length and complexity of its supply chain. In principle it may be desirable to trace the origin of component products to their raw material, but this is difficult in practice. As such, firms focus on their primary suppliers in requiring supply chain sustainability.

Chain of Custody and Traceability  Chain of custody and product traceability is a necessary condition to verify production practices including environmental and social sustainability. While most products have a verifiable chain of custody it is not always possible to trace this to the point of origin. For example, the aggregation of agricultural commodities is usually associated with the loss of traceability to the point of production, for example, the farm. As such there are limits to which E&S sustainability criteria can be applied to the entire supply chain.

Leverage Over Supply Chain Players  Leverage refers to the ability to demand E&S sustainability performance within the supply chain. As a result, the client should focus on the primary tier of suppliers, and possibly the secondary ones to have a meaningful impact.

Cost  The introduction of E&S sustainability criteria into the supply chain involves costs for the firm and its suppliers. For the firm demanding E&S supply chain sustainability there is a need for: (i) expertise to understand production processes within the supply chain and key E&S issues associated with these processes; (ii) expertise to define E&S supply chain sustainability requirements and integrate these into day-to-day operations through contracting, monitoring and verification.

Interaction with other Tools

Other guidance notes in the Pollution Management Sourcebook, including the following, are linked with Sustainability in the Supply Chain:

- Life Cycle Assessment
- Environmental Management Systems
- Cleaner Production
Labeling and Certification

Corporate Environmental and Social Responsibility Programs

References and Resources on Sustainability in the Supply Chain


Internet Sources

Business for Social Responsibility (BSR). A leader in corporate responsibility since 1992, Business for Social Responsibility (BSR) works with its global network of more than 250 member companies to develop sustainable business strategies and solutions through consulting, research and cross-sector collaboration: www.bsr.org

Council of Supply Chain Management Professionals (CSCMP). Council of Supply Chain Management Professionals (CSCMP) provides resources and services for its members through mentoring, speaking, sponsorships, roundtables and writing articles for our publications: www.cscmp.org

Institute for Supply Management (ISM) Founded in 1915, the Institute for Supply Management (ISM) is a not-for-profit association that provides opportunities for the promotion of the profession and the expansion of professional skills and knowledge: www.ism.ws

Supplier Ethical Data Exchange (Sedex), Sedex, the Supplier Ethical Data Exchange, is a membership organization for businesses committed to continuous improvement of the ethical performance of their supply chains: www.sedex.org.uk

Supply Chain Council (SCC) Supply Chain Council (SCC) is a global nonprofit organization whose methodology, diagnostic, and benchmarking tools help organizations make dramatic and rapid
improvements in supply chain processes. SCC has established the supply chain world’s most widely accepted framework for evaluating and comparing supply chain activities and their performance: www.supply-chain.org

This guidance note is part of World Bank Group publication: Getting to Green – A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
Stakeholder Engagement and Grievance Mechanisms*

Introduction

Stakeholder engagement aims to build and maintain an open and constructive relationship with stakeholders and thereby facilitate and enhance a company’s or a project’s management of its operations, including its environmental and social effects and risks.

The last decade has seen a fundamental transformation in the way that the private sector and government entities relate to stakeholders during project development. Whether building a road or assessing the feasibility of a mine, project proponents are finding that they can minimize risk and increase positive outcomes through early, ongoing engagement with stakeholders that builds trusting relationships. At the same time, stakeholders have increased expectations of their role in providing input into project development, particularly where they anticipate direct impacts or benefits. These stakeholder expectations may require project proponents to gain new engagement skills.

New approaches and forms of engagement are evolving as approaches to consultation and disclosure change from a short-term means of meeting regulatory and lender requirements to a longer-term, more strategic channel for relationship-building, risk mitigation, and identification of new business opportunities. This Guidance Note gives an overview of current approaches to stakeholder engagement as well as resources for further study.

Definitions

The following terms are often found in the literature on stakeholder engagement:

Stakeholders: Persons or groups who are directly or indirectly affected by a project as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. They may include locally affected communities or individuals and their formal or informal representatives, national or local government authorities, politicians, religious leaders, civil society...
organizations and groups with special interests, the academic community, or other businesses.

**Stakeholder Mapping**: The process of identifying a project’s stakeholders.

**Grievance**: An issue, concern, problem, or claim (perceived or actual) that an individual or community group wants a company or contractor to address and resolve.

**Grievance Mechanism**: A locally based, formalized way to receive, assess, and resolve stakeholder complaints about the performance or behavior of project proponents, including its contractors or employees\(^1\).

**Stakeholder Engagement, A New Approach**

The term “stakeholder engagement” is emerging as a way to describe a broader, more inclusive, and continuous process between a company and those potentially affected by a project. Stakeholder engagement can encompass a range of activities and approaches, and usually spans the life of a project. A broad array of terms describes this new approach to engaging stakeholders, including consultation, engagement, external relations, information disclosure and dissemination, and participation. These terms have been used loosely and interchangeably, because all these components can be part of an integrated engagement process. Although each organization or project must determine the type and scale of stakeholder engagement that best serves the organization’s or project’s purposes, the following are hallmarks of strong stakeholder engagement programs:

1. **Initiated Early, Continues through Project Completion** For the best outcomes, stakeholder engagement begins during project design and continues for the life of the project. Building a strong relationship from the start can help develop support for the project. Information exchange during the design phase can help organizations avoid costly mistakes that are difficult to fix at a later stage.

2. **Transparent and Honest** Interaction with stakeholders is characterized by transparency and honesty, and builds trust in the process.

3. **Managed as a Business Function** Engagement with stakeholders should be driven by a well-defined strategy and have a clear set of objectives, timetable, budget, and allocation of responsibilities. Organizations that take a systematic approach grounded in business operations get better results from their time and resources, and can more effectively track and manage stakeholder issues and risks.

4. **Inclusive** Efforts are made to include highly visible stakeholders as well as those that are typically underrepresented, such as minority groups, women, youth, and vulnerable people. When these important groups are left out of the

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\(^1\) Project level grievance mechanisms offer companies, projects and affected communities an alternative to external dispute resolution processes. Other grievance or dispute resolution mechanisms are part of a broader accountability framework and as such project-level grievance mechanisms are deemed to be only one of the tools available to respond to the need for greater accountability.
process, the stakeholder engagement process is inadequate.

5. **Culturally Appropriate and Accessible** Information is given in a format, language, and location accessible and comprehensible to stakeholders.

6. **Proactive** The project or organization plans ahead and identifies stakeholders and their concerns, supplies information, and solicits feedback before problems arise.

7. **Grievances Managed** Effective stakeholder engagement includes using a procedure to ensure that grievances are received and responded to in a timely manner, and are tracked so that results can be analyzed.

**Stakeholder Engagement: the Building Blocks.** Most programs for stakeholder engagement contain the following nine key components (eight of which are illustrated in figure 1):

- **Stakeholder Identification and Analysis** This involves determining who your project stakeholders are (this process is called **stakeholder mapping**). From this flows stakeholder analysis, a more in-depth look at the interests of stakeholder groups, how they will be affected, and what influence they can have on a project.

- **Information Disclosure** Good practice suggests adopting a “presumption in favor of disclosure,” which means being forthcoming with information whenever possible, especially if there is no compelling reason not to share it. To the extent possible, companies should be open about the project; in short, “tell it like it is.” Companies that share objective information of importance to stakeholders are more likely to be considered trustworthy.

To be able to participate in an informed manner, stakeholders should receive the information they need when they need it and in a format and a language that is accessible. There are almost unlimited methods of disclosing information, including radio programs, posters, meetings, theater, videos, consultation forums, puppet shows, comic books, expert presentations, participatory monitoring, and mock-ups. Proactive organizations can identify innovative means of information disclosure that target their stakeholders.

- **Stakeholder Consultation** This is a dialogue between the project (including third-party experts where necessary) and its stakeholders. This dialogue, much like in any relationship, is about initiating and sustaining constructive relationships over time. For projects with environmental and social impacts, this will not be a single conversation but a series of opportunities to create understanding about the project among those it will likely affect or interest, and to learn how these stakeholders view the project and its attendant risks, impacts, opportunities, and mitigation measures.
Listening to stakeholder concerns and feedback can improve project design and outcomes, and help a company identify and control external risks. It can also form the basis for future collaboration and partnerships. Methods for consultation are varied and might include large-scale forums, key stakeholder interviews, focus groups, mapping of community interests and concerns, and attitude surveys. However, all methods used should ensure that all stakeholders are sufficiently informed before consultation so they can be informed participants during consultation. In other words, stakeholders need to understand the project and its potential positive and negative impacts to develop informed opinions.

- **Consultation with Indigenous Peoples** Indigenous peoples, as social groups with identities that are distinct from dominant groups in national societies, are often among the most marginalized and vulnerable segments of a population. If a project will directly affect indigenous groups and their customary lands under use, early engagement is an essential first step in building longer-term processes of consultation, informed participation, and good-faith negotiation. In many countries, as with many financial institutions, there are special legal, statutory, and regulatory or procedural requirements for consulting indigenous people.

- **Negotiation and Partnerships** Effective stakeholder engagement lays the foundation for effective negotiation. With negotiation and partnerships, as with so many other things, the quality of stakeholder relationships is important to facilitating mutually acceptable outcomes. Negotiations with stakeholders can cover access to land or land acquisition, positions for local employment, or formation of benefit-sharing programs. Negotiations with stakeholders should be approached in “good faith,” that is, conducted with an open mind, a willingness to engage in the process, and a genuine desire to build solutions and reach agreements. Negotiations must be free from coercion and must take place with legitimate community representatives; stakeholders must also have equal access to the best available information.

- **Grievance Management** A grievance mechanism should be scaled to fit the level of risks and impacts of a project. It should flow from a company’s broader process of stakeholder engagement and business integrity principles, and integrate the various elements of engagement discussed so far. For more detail on grievance mechanisms, see the following section.

- **Stakeholder Involvement in Project Monitoring** One way to help satisfy stakeholder concerns and promote transparency is to involve project-affected stakeholders in monitoring any mitigation measures or other environmental and social programs. Frequently called “participatory monitoring,” these programs can increase the frequency and quality of company communication with communities. Such participation and the flow of information can also encourage stakeholders to take a greater degree of responsibility for their environment and
welfare, and to feel empowered that they can do something practical to address issues that affect their lives. Participatory monitoring also tends to strengthen relationships between the project and its stakeholders.

- **Reporting to Stakeholders** In both personal and business relationships, follow-through is important. The same principle applies to stakeholder engagement. Once consultations have taken place, stakeholders will want to know which of their suggestions will be used, what risk or impact mitigation measures will be put in place to address their concerns, and how, for example, project impacts are being monitored. Often the same methods used in information disclosure are applied to reporting back to stakeholders. This can include large-scale forums, brochures, targeted meetings, and consultative committees.

- **Management Functions** Increasingly, good practice points to incorporating stakeholder engagement activities into a company’s environmental and social management system. In practice this means making its management systematic by integrating it with core business activities. Consequently, stakeholder engagement should be managed as one would manage any other business function: with clearly defined objectives and targets, professional and dedicated staff, established timelines and budget, and senior management responsibility and oversight.

Eight of these components are shown in figure 1, which illustrates their interconnectedness.
Figure 1. Major Components of Stakeholder Engagement

Information Disclosure
Communicate information to stakeholders early in the decision-making process, in ways that are meaningful and accessible, and continue this communication throughout the project life.

Stakeholder Identification & Analysis
Invest time in identifying and prioritizing stakeholders and assessing their interests and concerns.

Stakeholder Consultation
Plan out each consultation process, consult inclusively, document the process, and communicate follow-up.

Management Functions
Build and maintain sufficient capacity within the company to manage processes of stakeholder engagement, track commitments, and report on progress.

Negotiation and Partnerships
For controversial and complex issues, enter into good faith negotiations that satisfy the interests of all parties. Add value to impact mitigation or project benefits by forming strategic partnerships.

Good Stakeholder Engagement

Stakeholder Involvement in Project Monitoring
Involve directly affected stakeholders in monitoring project impacts, mitigation and benefits, and involve external monitors where they can enhance transparency and credibility.

Reporting to Stakeholders
Report back to stakeholders on environmental, social and economic performance, both those consulted and those with more general interests in the project and parent company.

Grievance Management
Establish accessible and responsive means for stakeholders to raise concerns and grievances about the project throughout its life.

Grievance Mechanisms

A grievance can be defined as “a real or imagined cause for complaint.” It may be expressed formally (for example, in writing) or informally (for example, by telephone). In the context of development projects, grievances may relate to alleged or potential risks and adverse impacts associated with a project, an alleged non-compliance with a project commitment, or to matters concerned with employment and working conditions. A grievance mechanism is an important pillar of the stakeholder-engagement process because it creates opportunities for companies and communities to identify problems and discover solutions together. It also helps evaluate the performance of the social and environmental management system, and to strengthen project operations by informing the company about needed improvements.

Stakeholders generally expect an acknowledgment of their problem or concern as well as an honest response to questions about company activities. Depending on the grievance, stakeholders may want a detailed explanation, an apology, compensation, or modification of the conduct that led to the grievance. In expressing their concerns, they also expect to be heard and taken seriously. They may also want to be involved in monitoring the conduct so that it will not happen again. Although grievance mechanisms must be designed to suit the project context, both the approach and the underlying principles are aligned with the other components of the company’s stakeholder engagement process. The grievance mechanism should have the following characteristics:

- **Procedure Is Formalized** Grievances are systematically recorded, tracked, analyzed, and responded to. The process is predictable, with known procedures and timeframes for each stage. The system provides a learning opportunity for companies. Summary results from the grievance monitoring are given to stakeholders.

- **Proportionality** The mechanism is scaled to potential project risks and adverse impacts. Staffing is appropriate for the volume and type of grievances.

- **Cultural Appropriateness** A project-level grievance mechanism should take into account specific cultural attributes as well as traditional mechanisms for raising and resolving issues, to ensure that the concerns of significantly different groups and subgroups are addressed appropriately.

- **Accessibility and Responsiveness** The grievance mechanism must be one that is clear and understandable. The mechanism must be accessible and responsive to all segments of the affected communities, and provided to all segments at no cost to them. The community must be well informed about the mechanism. Methods for achieving this can include information booths, community liaisons who schedule regular visits to stakeholders, phone hotlines, and open-door policies at the project site.
• **Transparency and Accountability to All Stakeholders**
A grievance mechanism should be a way for the community to hold the company accountable, to be sure it takes community inputs seriously, deals with them through a clear and transparent process, follows through with actions, and communicates with the community. A grievance mechanism is transparent when members of the affected community

  o know who in the organization handles complaints and communicates outcomes, and who is in charge of the mechanism’s oversight;
  
  o have input into its development;
  
  o have enough information on how to access it; and
  
  o have power to ensure that the process is adhered to by those directly responsible for managing it.

• **Staffed and Budgeted** The company or organization must ensure adequate staffing and budgeting of the mechanism.

• **Appropriate Protection** A grievance mechanism will work when communities are encouraged to share their concerns freely, with the understanding that no retribution will be exacted for participation. A mechanism free of retribution will consider potential dangers and risks to complainants and incorporate ways to prevent harm.

These precautions include a clear policy of no retaliation, measures to ensure confidentiality and physical protection of complainants, safeguarding of personal data collected in relation to a complaint, and an option for complainants to submit anonymous grievances where necessary.

• **Redress Mechanism** The grievance mechanism must allow access to an external body for consideration of the grievance where necessary.

**Five Step Grievance Process.** Grievance mechanisms should be scaled to the size and degree of complexity of projects as well as to the potential for significant impacts. Typical grievance procedures will generally include at least the following five steps:

1. **Publicizing the Grievance Mechanism to Stakeholders** Organizations should ensure that stakeholders know who can raise a grievance, where grievances can be filed, who is responsible for receiving and registering complaints, what sort of response stakeholders can expect from the company including timing of response, and what other rights and protections are guaranteed.

2. **Receipt, Register, and Tracking of Grievances** The method for registering and tracking grievances will vary with the scale of the mechanism. However, all incoming grievances should be acknowledged and registered in a grievance log, which can be as simple as a spreadsheet or as complex as the situation demands. All methods should allow the organization to view trends and to monitor grievance outcomes.
3. **Review and Investigation of Grievances**  
   For a grievance mechanism to work, all complaints should be handled as promptly as possible, depending on the nature and complexity of the matter. Some grievances are easily resolved and are actually requests for additional information. Other grievances can be quite complex, such as those involving multiple parties and land ownership. In these cases, management, contractors, and even external experts may become involved in the investigation. In circumstances where the resolution process takes time, the mechanism must ensure that the complainant is informed of the progress.

4. **Development of Resolution Options, Response to Grievances, and Close-out**  
   Like the grievance mechanism itself, resolution options can be very simple and streamlined, or they can be complex and drawn out, involving multiple parties. Resolution of grievances caused by a one-off breach of environmental standards, or by a single traffic incident, will differ significantly from complex and repetitive community grievances. More complex and controversial issues, especially those raised by large groups of people, usually involve overlapping issues with no obvious solution. Resolution of these issues may benefit from access to independent bodies that can provide the credibility that comes with impartiality. Such independent bodies can foster dialogue and collaboration between companies and affected communities as they undertake the often-lengthy process of exploring resolution options. Regardless of the outcome, all complainants should receive a response.

5. **Monitoring, Reporting, and Evaluation of the Grievance Mechanism**  
   Monitoring and reporting can be tools for measuring the effectiveness of the grievance mechanism and the efficient use of resources. These tools can also help determine broad trends and recurring problems so they can be resolved before they become points of contention. Monitoring helps identify common or recurrent claims that might require structural solutions or a policy change, and it enables the company to capture any lessons learned in addressing grievances. Monitoring and reporting also create a base level of information that can be used by the company to report back to communities.

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**Benefits of Stakeholder Engagement and Common Challenges**

**Benefits of Stakeholder Engagement.**  
Organizations that have grasped the importance of actively developing and sustaining relationships with affected communities and other stakeholders throughout the life of a project reap the benefits of improved risk management and better outcomes on the ground. The new approach to stakeholder engagement has benefited both projects and stakeholders. Projects that apply stakeholder engagement tools and disclose project information, actively seek feedback from communities, encourage stakeholder design of mitigation measures, and establish relationships with stakeholders based on
mutual trust are more likely to receive and sustain support for the project. Following are some benefits from an effective stakeholder engagement process:

Support for the Project Stakeholders are more likely to support a project’s development if they have been involved in identifying project risks and mitigating impacts, and if they believe they will benefit from the project. Similarly, communities are more likely to trust and support a company if there are mechanisms in place to manage grievances, as well as mechanisms for holding the company accountable for its activities.

Risk Management Stakeholder engagement is one way to manage project and reputational risk. A sound process for stakeholder engagement that offers continuous access to information, responds to grievances, and regularly solicits feedback can substantially reduce the risk of grievances arising in the first place, or escalating to a level that could undermine business performance.

Improved Project Outcomes Stakeholders often have knowledge about the local area that companies do not. Consequently, engaging stakeholders during the project design phase can help ensure that the project has adequate mitigation measures. Understanding what stakeholders’ concerns and expectations are from the outset enables organizations to plan accordingly.

ISO Certification Establishing robust procedures for consulting with external stakeholders will facilitate ISO certification. These procedures should include disclosing information about key aspects of the social and environmental management system to relevant stakeholders.

Reduction of Project Costs Opposition to a project, such as blockages and demonstrations, can be extremely costly in money and time. Robust stakeholder engagement programs that are well designed and implemented can significantly reduce the overall cost of project development by promoting stakeholder support, and reducing conflict caused by misunderstanding or lack of information.

Common Challenges Stakeholder engagement empowers stakeholders. Depending on the country and project context, there may be restrictions on the degree to which stakeholder engagement is encouraged. Various factors (for example, historical, political, economic, social, and cultural ones) may limit the extent to which best-practice stakeholder engagement can be developed and implemented.

Complex Socio-Economic Contexts Companies need to be prepared for the fact that they are entering into a preexisting yet dynamic environment with established histories and cultures, and often-complex political, social, and economic relations between groups. These relations can be destabilized by the development of a project and by the development process that may accompany it. Stakeholders typically do not present a unified front, and there may be a broad diversity of opinion and support for the project, with some parties in the same community in favor of the project and others opposed. There is no easy formula for addressing these challenges, except to manage the process proactively and adapt some of the
established good practice approaches and principles described in this toolkit to fit your own local context.

**Organizational** Project managers are increasingly recognizing the importance of adequate stakeholder engagement and are staffing and budgeting accordingly. Complex projects with insufficient internal resources for this critical process may find that stakeholders’ failure to support the project results in costs that could have been avoided.

Perception versus Reality The culture, language, and vision of stakeholders often differ from those of companies. What companies may understand to be a negligible issue may in fact be of enormous concern to communities. It is important to work to understand the real concerns of stakeholders to be able to provide the right information or the appropriate mitigation for the situation.

**Interaction with Other Tools**

Stakeholder engagement and grievance mechanisms can benefit from a range of supplementary tools. The potential for their application across a wide array of private sector and government contexts encourages project proponents to develop innovative relationships with stakeholders reflecting diverse considerations. As such, various other guidance notes in the Pollution Management Sourcebook are linked with Stakeholder Engagement and Grievance Mechanisms, including the following:

- Corporate Environmental and Social Responsibility (CESR) Programs
- Public Access to Information for an Active Citizenry
- Advocacy and Participation in Decision-making for an Active Citizenry
- Ability to Complain and Access to Legal Recourse (Public Interest Litigation Cases) for an Active Citizenry

**Overview of Stakeholder Engagement or Consultation Guidelines**

Today, many evolving global initiatives reflect an increasing international interest in the benefits of multi-stakeholder models. The following practical initiatives shape themselves around social and environmental considerations, in an effort to harness both public and private interest to green growth:

**National Laws.** These typically require project proponents to conduct public consultations before and after conducting environmental social impact assessments. Depending on the country, these public consultation forums can be held by the project sponsor or the relevant government authorities. Some countries have increased consultation requirements when stakeholders are indigenous people.

**Equator Principles.** These were established in 2003 through the voluntary participation of several Equator Principle Financial Institutions (EPFI) to
ensure that projects to be financed were developed in a socially responsible manner and reflected sound environmental management practices. The Equator Principles are almost identical to the IFC Performance Standards. Currently, 72 banks are signatories (Equator Principles Association 2011).

International Finance Corporation (World Bank Group) Performance Standards. These social and environmental performance standards are guidelines on how projects will engage with stakeholders. The standards mandate that communities be appropriately consulted during project design and development, as well as engaged in project decision-making processes. The standards also require projects to establish a grievance mechanism as part of their social and environmental management system. Current standards call for free, prior, informed consultation (FPIC) of indigenous people. Revised standards will be issued in January 2012; these will require free, prior, informed consent of indigenous people impacted by projects.

ISO 14001. This is a voluntary international standard that is a framework for a sound environmental management system. The standard is applied by private sector and governmental entities around the globe and allows for standardized assessment and certification by independent agencies worldwide. ISO 14001 calls for establishing procedures for receiving, documenting, and responding to communications from external interested parties. There is a requirement that the entities consider externally communicating significant environmental aspects of their project activities.

References and Resources for Stakeholder Engagement and Grievance Mechanisms

Stakeholder Engagement


Guidance Notes on Tools for Pollution Management


Participatory Methods and Techniques


Grievance Mechanisms


IPA2 (International Association for Public Participation). Thornton, CO: International Association for Public Participation. www.iap2.org


This guidance note is part of World Bank Group publication: Getting to Green—A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
Corporate Environmental and Social Responsibility Programs

Introduction

The term “Corporate Environmental and Social Responsibility (CESR)” has multiple definitions and many synonyms including Corporate Social Responsibility (CSR), Corporate Accountability, Corporate Citizenship, or simply Corporate Responsibility (CR). Over the last two decades various stakeholders have characterized and applied the CESR concept in many different ways: as a means to achieving compliance; as a form of charity; as corporate philanthropy; as a component of environmental and social risk management; and, most recently, as strategic CESR-driven product services and processes. While this variability has created, and continues to create, confusion and perhaps even justify some criticism of CESR, it has also promoted a clearer understanding of what CESR constitutes today.

Description and Application of Corporate Environmental and Social Responsibility Programs

In general, CESR represents issues that embrace financial integrity; corporate ethics; and dimensions of economic, social, and environmental value added. It refers to a business approach embodying open and transparent business practices; ethical behavior; respect for stakeholders; and a commitment to add economic, social, and environmental value.

The definition used by the ISO 26000 Social Responsibility standard is a useful reference point, because it focuses on both environmental and social impacts, and was arrived at through a global multi-stakeholder engagement process. The definition states that an organization’s social responsibility is the responsibility of an organization for the impacts of its decisions and activities on society and the environment, through transparent and ethical behavior that:

- contributes to sustainable development, including the health and welfare of society;
Guidance Notes on Tools for POLLUTION MANAGEMENT

- takes into account the expectations of stakeholders;
- is in compliance with applicable law and consistent with international norms of behavior;
- and is integrated throughout the organization and practiced in its relationships.

(Source: ISO Web site)

CESR programs seek to integrate key areas of ethical concern into a company’s core values. Such programs include the following common focal areas:

- anti-bribery and anti-corruption measures;
- clean and alternative technologies;
- community development and investment;
- corporate governance and ethics;
- corporate philanthropy and employee volunteering;
- fair and ethical trade;
- health, safety, and environmental stewardship;
- human resource management;
- human rights;
- labor rights;
- responsible marketing and labeling;
- socially responsible investment; and
- supply chain performance and relations.

Strategic CESR. The cutting-edge conceptualization of CESR is “strategic CESR”. This concept embodies the idea that for sustainability efforts to be meaningful and sustainable, it is imperative that companies focus on issues that are important to their stakeholders and that can also help maximize business results. In other words, strategic CSR should be closely linked with the business strategy of a company. It is also referred to as a win-win or shared value.

Adopting strategic approach to CESR does not mean that companies should abandon all CESR activities that are more philanthropic in nature and benefit less vocal stakeholders. Rather, it suggests that the majority of the company’s CESR investments should be coordinated with its business strategy and be supported by the company’s core assets and expertise.

Building a CESR Strategy and Program. While there are many guidelines that can assist a firm in addressing the various aspects of CESR, each firm must engage in its own process of developing an appropriate CESR strategy so as to ensure that the firm’s specific requirements are taken into account. Figure 1 is a flowchart of the key steps associated with this process.
1) **Identify and Understand Company Values and Priorities.** Each organization has its own values, mission, and goals. If these have not already been formulated, then company leadership should work together in defining the organization’s values and mission statement. Most companies include such statements in public annual reports. The organizational values should be linked to the firm’s core business—that is, to the firm’s products and services, and to the personal values and convictions of the founders and current leadership. Once defined, the values and mission should be taken into consideration when deciding on the program areas of the CESR strategy.

At this stage, engagement with senior management is critical. More often than not the personal values, motivation, and creativity of company leaders is the central factor associated with a firm’s adoption and commitment to CESR, and its integration within the firm. Such integration, particularly with senior management, must be broad-based and genuine,
so that management maintains its commitment to CESR in the face of difficult situations.

2) Engage with Relevant Stakeholders to Identify Core CESR Issues. A company’s CESR strategy and direction should be informed by engaging the stakeholders who are the target of the CESR activities. Companies need to identify the stakeholders most relevant to their business values and objectives, and then engage with them through dialog to uncover the emerging social and environmental issues of concern to these stakeholders and which also are relevant to the core business and competitive advantage of the firm.

Based on this engagement and with desktop research on CESR issues and trends, companies should be in a position to identify several core CESR issues that could potentially be the focus of their CESR strategy. Certain issues are of more relevance to some industry sectors than to other sectors. Engaging with stakeholders should be an iterative exercise that should not necessarily end before commencing the next steps. Indeed stakeholders should be consulted throughout the CESR strategy implementation, and adjustments to the strategy should be made accordingly.

3) Define CESR Design Parameters. Before embarking upon designing a CESR strategy, companies should first define the primary purpose and objectives of their CESR. First, a firm may decide to focus on a CESR that focuses on market development or social investment, or on a combination of the two. Second, the firm should identify the stakeholders who are the target of the CESR strategy and investment. Third, the firm should consider the indicated budget for the CESR strategy and programs. An important aspect of budget considerations is the ability to sustain the CESR program over time irrespective of market performance. This is particularly the case for social and community development programs that may form the basis of establishing long-term, trust-based relations with communities within the project area of influence. Finally it should be noted that a project’s circumstances may change over time; consequently, firms should be flexible about the design parameters of their CESR strategy.

4) Build the Business Case and Secure Management Support. Following identification of core CESR issues that could be included in the CESR strategy, the team should work to articulate a business case and a CESR program proposal (ideally with projected figures and results) to secure senior management support. The support of leadership is crucial for creating and managing organizational cultural change throughout the firm.

5) Embedding the New CESR Vision and Strategy. A review of private sector CESR activities shows that CESR is often managed in silos or as add-ons to an organization’s public relations and communication functions. However, strategic CESR requires the integration of the company’s CESR vision, strategy, and programs into the organization. Typically this is a time-consuming process that can only be achieved through the
allocation of resources for program development and staff training.

6) **CESR Program Implementation.** CESR component programs may be implemented by staff or a wide range of partners including NGOs and government. Credibility in the public eye is an important issue in program development and implementation, and in subsequent communication and reporting. The CESR implementation process should be iterative, with constant dialog and engagement between internal and external stakeholders once the CESR type and direction has been decided. Stora Enso in China has its CESR department of just two people work with the UNDP to implement social investment programming with the local community.

7) **Communication and Reporting.** The communication and reporting of a company’s CESR strategy, objectives, and component programs are critical in CESR.

The Global Reporting Initiative (GRI) has been recognized as the globally accepted CESR reporting standard, and it has been widely adopted as a framework for annual reporting of CESR strategy and component programs. The GRI helps companies report on over 60 CESR-related indicators, as well as helping companies with stakeholder dialog and the identification of CESR issues. In order to gain credibility from stakeholders for the CESR reporting and communicating, companies should be innovative and creative. For example, a company could invite an independent assurance panel of experts from civil society organizations or other respected leaders relevant to their industry sector to comment on the report. Alternatively, a company could engage with new social media formats such as Facebook to allow stakeholders to interact with the company about its CESR policies. Such activities can also be effective learning resources for companies working with CESR.

**Prerequisite Factors for Corporate Environmental and Social Responsibility Programs**

CESR programs embody the idea that for sustainability efforts to be meaningful and workable, it is imperative that companies focus on issues that are important to their stakeholders and that can also help maximize business results. In other words, strategic CESR should be closely linked with the business strategy of a company.

Adopting strategic approach to CESR does not mean that companies should abandon all CESR activities that are more philanthropic in nature and benefit less vocal stakeholders. Rather, it suggests that the majority of the company’s CESR investments should be coordinated with its business strategy and be supported by the company’s core assets and expertise.
Advantages and Limitations of Corporate Environmental and Social Responsibility Programs

Advantages of CESR  A firm’s decision to commit to CESR may be based on several reasons. More and more companies invest in addressing key environmental, social, and governance issues to respond to stakeholder concerns, develop their markets, and gain competitive advantage. Some of the most common drivers are listed below:

Branding and Reputation  CESR may encourage consumers to make a positive association with a product or firm. The branding and reputational benefits may be associated with a higher market profile, increased competitiveness, and higher returns. In developed countries, consumers are becoming more aware of companies’ CESR activities and increasingly use the information as one factor influencing their choices.

Social License to Operate  CESR may be an important contributor to gaining a social license to operate. Affected people within the project area of influence may develop a positive perception of a firm as a partner in development through the process of collaborating with a firm to implement a CESR program.

Access to Investment  CESR may be an important component of ethical and sustainable investing, since some investors prefer to invest only in companies that have demonstrable environmental and social performance.

Employee Motivation  An important motivation and benefit accruing from CESR for companies is that they can become more attractive for recruiting new talent. A company’s CESR credentials may serve as an important factor affecting MBA graduates’ decisions regarding their preferred employer. Further CESR can also improve employee morale, motivation, and reduce staff turnover.

Government policy, regulation, and support  In some cases, government may be the principal stakeholder driving CESR by promoting firms’ adoption and development of strategic CESR through policy, regulation, and/or support.

Limitations of CESR  CESR is vulnerable to criticism for various reasons. One reason is that multiple definitions and multiple drivers create a degree of ambiguity regarding what constitutes CESR and the motives for engaging in CESR. A second reason is the voluntary, beyond compliance nature of CESR. A third reason is the lack of accepted standards, as well as of objective measurement, monitoring, and
evaluation. These limitations raise questions about the capacities of the private sector to monitor, evaluate, and publically report on its social and environmental responsibilities.

These reasons have provided the basis for claims that CESR is “greenwash” and lacking in credibility. While GRI reporting (involving auditing of CESR activities) has addressed such criticism, it remains that the implicit relationship between social good on the one hand, and public relations, brand, market, and reputational benefits, on the other hand, is always subject to criticism.

**Interaction with other Tools and Possible Substitutes**

There is a wide array of CESR guidance and tools in the public domain, which range from all-inclusive to component-oriented guidance. In the latter, the focus is on individual program components, including the development of CESR strategy, design, planning, and implementation.

The UN Global Compact conducted a study of 97 different CESR-related standards, guides, and tools to assess how well they addressed development of an effective business case for CESR. Table 1 shows a sample of 14 of the CESR-related guides in three different groups.

1) High-level CESR issues are addressed by ISO 26000, CERES, UN Principles for Responsible Investment, Equator Principles OECD and UN Global Compact.

2) CESR implementation is addressed by GLN, GRI, and BSR.

3) Guides for ranking large corporations with respect to their CESR performance include Dow

| Table 1: Comparative Analysis of Different CESR Tools for Creating a Business Case |
|---------------------------------|---------------------------------|---------------------------------|
| Strategy                        | Materiality Assessment          | Implementation/Planning         |
| ISO 26000                       | •                               | •                               |
| PRI                             | •                               | •                               |
| CERES                           |                                  | •                               |
| OECD                            |                                  |                                  |
| UN Global Compact               |                                  | •                               | •                               |
| Equator Principles              |                                  | •                               |                                  |
| GLN                             | •                               | •                               | •                               |
| GRI                             | •                               | •                               | •                               |
| BSR                             | •                               | •                               | •                               |
| SA 8000                         |                                  | •                               |                                  |
| Management Consultants          | •                               | •                               | •                               |
| DJSI                            |                                  | •                               | •                               |
| FTSE4Good                       |                                  |                                  |
| Bovespa Sustain-ability Index   |                                  |                                  |

*Source: AccountAbility Web site.*
Jones Sustainability Index, Bovespa Sustainability Index, and FTSE4Good. All these individual tools are important sources of information for an organization developing a CESR program.

Box 1 provides details of the different groups described.

**Box 1. Examples of CESR Guides**

**High-Level CESR Issues – ISO 26000**  The “ISO 26000:2010 Guidance on social responsibility” (see ISO Web site) is one of the standards that address high-level CESR issues. It offers a working and practical guide and definition (stated in the first section) of social responsibility for all organizations. The standard was developed over the course of five years in a multi-stakeholder consensus process. It was officially launched in late 2010, and guidance for implementation has been disseminated since then. The standard highlights the following core subjects for social responsibility, which firms should address. The standard offers further guidance as to how the following subjects and sub-subjects should be individually addressed: organizational governance, human rights, labor practices, the environment, fair operating practices, consumer issues, and community involvement and development.

**CESR Implementation focused – GLN**  The Global Leadership Network (GLN) offers a self-assessment tool for companies to identify material social and environmental issues in relation to company business objectives. Once the tool identifies these issues, it guides companies through to prioritizing the relevant social and environmental issues that will be addressed. After selecting the CESR issues to be addressed, the GLN tool leads companies through planning and budgeting for the implementation of each CESR issue within the business’s overall operations and strategy.

The GLN also serves as a peer-group organization where other member companies share best practices and meet on an annual basis. Therefore the GLN is a platform for learning and benchmarking in relation to CESR practices and performance. However, caution is required regarding GLN’s self-assessment methodology, since some companies have needed the assistance of external CESR consultants to help them through the process.

**Ranking CESR Performance – Dow Jones Sustainability Index**  The Dow Jones Sustainability Index provides a guide for ranking large corporations by their CESR performance. Dow Jones launched the first set of global sustainability indexes in 1999 called “Dow Jones Sustainability Index (DJSI).” DJSI tracks the financial performance of the leading sustainability-driven companies worldwide. DJSI focuses on how a company recognizes the risks and opportunities arising from sustainability issues in its business strategy. Sustainability Asset Management (SAM), an investment group focused exclusively on sustainability investing, manages DJSI. SAM assesses companies in different Dow Jones indexes on their corporate sustainability. SAM selects the top companies within industry groups for inclusion in the DJSI indexes.

**Practical Examples of Corporate Environmental and Social Responsibility Programs**

**Brazil.** Grupo Schahin Construction, an IFC client in Brazil, chose sustainable construction as a business response to a pressing CESR issue. As a result, sustainable construction catalyzed internal projects to improve construction site practices. A green building real estate company also identified Schahin as a potential partner.

Natura, the Brazilian cosmetics firm, identified its local communities as important stakeholders for engagement due to their role as suppliers of raw materials. Natura’s values are based on the concept of sustainable development, and this required engaging with and building the capacity of the local impoverished communities in the Amazon region. This has meant training, certifying, monitoring, and dialog with the communities to ensure the sustainability of the sourcing process.
Sadia, a Brazilian agriculture and good producer, linked the company’s key values to environmental and pollution abatement. The firm consequently decided to work with local pig farmers who were also suppliers in using the animal waste to generate methane gas for energy and also to sell as carbon credits.

**Chile.** Kinross Gold Maricunga is an example of a firm’s social investment oriented CESR program that defined its parameters. The mining company established a budget for its social investment program and engaged closely with the local community. Together they created a social investment agreement or “protocol” as they refer to it. The protocol sets objectives and guidelines for how the social investment and relationship will be managed.

**South Africa.** Lonmin, a producer of platinum-group metals operating in South Africa has a sustainability strategy that focuses on economic growth, safety, health, human capital, community, and environment.

**United States.** Ford Motor Company selected “reducing climate change” as part of its core values. As a result Ford focused on making their cars more energy efficient and also able to operate on cleaner sources of fuel such as electricity.

**United Kingdom.** The UK retailer Marks and Spencer identified sustainability as its core value towards customers, employees, and other stakeholders. This led the company to devise “Plan A”, which would create a new sustainability-focused line of goods that was also produced and distributed in an ecological and energy-efficient manner.

### References and Resources on Corporate Environmental and Social Responsibility Programs

The following provides additional sources of information from some of the reputable CESR related organizations and think tanks:

#### Thought Leadership

- **AccountAbility**, “AccountAbility: Setting the Standard for Corporate Responsibility and Sustainable Development,” [AccountAbility](http://www.accountability.org). (Strong focus on stakeholder engagement standards. Based in the UK, USA, China and Brazil.)
- **Boston College Carroll School of Management**, “Center for Corporate Citizenship,” [Boston College Carroll School of Management](http://www.bcccc.net).
- **BSR**, “BSR: The Business of a Better World,” [BSR](http://www.bsr.org). (USA thought leader and consultant for CSR also based in Europe and China.)
- **SNV** (Netherlands Development Organization), “SNV: Netherlands Development Organization,” [SNV](http://www.snvworld.org). (Since 1965, Dutch development organization present in 35 emerging market countries with the aim for the private sector to reduce poverty)
- **SustainAbility**, “SustainAbility,” [SustainAbility](http://www.sustainability.com). (Started up by the influential John Elkington. Focus on CESR as a strategy for shared value. Offices in London, USA, India and China)
International CESR Standards


Academic Sources


Academic Institutions

Doughty Centre for Corporate Responsibility, Cranfield School of Management, UK, http://www.som.cranfield.ac.uk/som/p1080/Research/Research-Centres/Doughty-Centre-for-Corporate-Responsibility
2.3 Financial Institutions
Environmental and Social Policy for Financial Intermediaries

Introduction

The objective of this Guidance Note is to inform financial intermediaries (FIs) and other interested parties about the role of FIs in reducing pollution and managing other adverse environmental and social (E&S) impacts of their financing activities. This Note presents an overview of E&S risks and opportunities for FIs, and outlines ways FIs can reduce E&S impacts to improve their business sustainability and contribute to national E&S development goals by implementing an environmental and social management system (ESMS).

Commercial banks, leasing companies, investment funds, and other FIs act as the intermediaries between fund providers and fund users. FIs may affect the environment directly through their in-house use of energy and resources, and indirectly through the financial products and services they offer to enable their clients (industrial and commercial borrowers, investee companies, or projects) to conduct activities having a range of E&S impacts. Such impacts in turn create the E&S risks and opportunities for the FIs. This Note focuses on mitigating such indirect E&S impacts and risks for FIs.
**E&S policy and objectives.** The policy shall state the FI’s commitment to managing E&S risks associated with its client activities. Typically, this will include a policy statement committing the FI to ensure that its clients or financing activities will meet the requirements of applicable national E&S laws and regulations, and applicable internationally recognized performance standards or best practices. The policy may also identify activities that the FI will not support, for example, the production or trade of products or activities deemed illegal or subject to international bans under host country laws or international conventions and agreements.

**Transaction screening and risk categorization.** The FI shall screen all its transactions or clients against established criteria and categorize them according to their potential E&S risks. This screening and categorization will determine the scope of the FI’s E&S due diligence. The categorization will enable the FI to prioritize its transactions and focus more on clients or client activities with high E&S risks.

**E&S due diligence and corrective action plan.** The FI shall conduct E&S due diligence (ESDD) for all its transactions, although the extent of ESDD may vary transaction by transaction. For low-risk transactions such as retail finance, the ESDD may be a simple review of the client’s operations to confirm that the FI’s financing will be used for the intended purpose and is consistent with the FI’s business principles. For medium-risk transactions such as financing that is provided to small and medium enterprises, the ESDD will include an overview of the client’s operations, which may require a site visit to identify potential E&S risks and impacts. E&S risks and impacts of this scale are typically reviewed within the host country’s E&S regulatory framework. The FI needs to ensure that the client complies with all applicable regulatory requirements.

For high-risk transactions such as large corporate or project financing, the FI should carry out an in-depth ESDD to assess potential E&S risks and impacts against applicable national E&S laws and regulations and where appropriate, internationally recognized standards or practices, and identify proper action plans to manage these risks and impacts. Depending on the complexity of the client’s business and the associated E&S risks, the FI should, where necessary, retain outside experts. Based on the ESDD (or subsequent monitoring) of the client’s E&S performance, the FI shall require clients to implement corrective actions within a specified timeframe.

**E&S covenants.** The FI shall incorporate the corrective action plan and other E&S requirements in its legal agreement with the client. The scope of E&S clauses depends on the transaction type (loan, equity investment, or risk-sharing) and the E&S risks of the client operations. To strengthen these clauses, FIs often set the satisfactory execution of certain critical corrective actions as conditions of (first or subsequent) disbursement or conditions of payment in the risk-sharing cases. FIs shall consider including remedy and exit clauses in the financing agreement and exercise them in case the E&S risks cannot be appropriately mitigated.

**Monitoring E&S performance.** The FI shall monitor client’s compliance with the E&S requirements as
determined in the ESDD and in the E&S covenants by requiring periodic reports from clients and conducting periodic site inspections by qualified personnel on behalf of the FI. Performance gaps should be discussed with the client and resolved within a reasonable time.

**Supporting tools, systems, and documentation.** To help FI staff and clients properly assess E&S risks, and monitor corrective actions and ongoing E&S performance, the ESMS should include proper tools such as checklists, templates, reporting forms, and reference materials. The ESDD for all transactions and monitoring activities should be properly documented.

**Roles, responsibilities, and capacity building.** The FI shall establish the necessary organizational structure, and assign roles and responsibilities to its various departments and staff positions for carrying out the tasks above. The FI should appoint an ESMS officer from senior management to oversee the FI’s overall E&S risk management and ESMS implementation. Depending on the FI’s portfolio size and complexity, the ESMS officer could have assistance from coordinators responsible for day-to-day ESMS implementation. The ESMS officer should bring E&S issues to investment-review sessions and decision meetings. Relevant staff should be trained on E&S policies and procedures, and on use of supporting tools and guidance materials.

The FI’s ESMS officer should periodically review ESMS implementation at the aggregate portfolio level and at the individual transaction level, and recommend improvements to senior management. The scope and implementation of an FI’s ESMS should be appropriate to its portfolio activities. Box 1 describes the businesses and ESMS requirements for four types of FIs that are typical in developing countries.

**Environmental and Social Risks — Assessment and Management**

Environmental issues range from temporary to permanent changes in the atmosphere, water, and land due to human activities, which can result in irreversible impacts on the environment. Social issues may emerge in the workplace of companies or in surrounding communities affected by the companies’ operations. Table 1 displays the areas in which E&S impacts should be properly monitored by both FIs and their clients.
Box 1: E&S Risk Management of Financial Intermediaries

**Commercial banks** may finance different business entities or activities, such as large corporations, small and medium enterprises, housing developments, trade and other short-term financing, and retail banking. As a result, commercial banks’ exposure to E&S risks varies significantly according to their clients and clients’ activities in different industries and geographic locations. For example, E&S risks will be more significant for large corporate or project finance transactions, which are typically large size and of long duration, and usually tied to clients whose operations are complex and have potentially high E&S impacts.

E&S risks will be lower for short-term finance transactions or transactions that support the activities of small and medium enterprises. For retail transactions such as mortgages or consumer loans, the E&S risks are generally considered minimal. As a starting point, a commercial bank should review its portfolio, broken down by transaction type and by exposure to different industry sectors. The bank may thus adopt a tiered approach and apply E&S risk-management requirements and procedures suited for different types of transactions and business segments. In general, the procedure shall be substantial for high-risk transactions, and streamlined for low-risk transactions.

**Leasing companies** provide financial or operational leases that vary in duration and in the leased asset, such as office equipment, vehicles, real estate, and specialized equipment and machinery. Leasing companies’ exposure to E&S risks is generally related to the installation, operation, and maintenance of the leased assets and will be more significant for transactions involving specialized or heavy equipment or machinery for use in certain industry sectors such as forestry operations, cargo shipping, oil and gas, and mining activities. Similar to banks, leasing companies should apply E&S risk-management procedures commensurate to each transaction type as part of their overall risk-management framework.

**Microfinance institutions** (MFIs) offer small loans (often in the range of a few hundred to a few thousand dollars) to families and to owners of small businesses whose operations are generally small. As a result, MFIs’ exposure to E&S risks is typically low, requiring in most cases some simple E&S risk-management procedures to screen transactions against a list of pre-established excluded customers or activities such as those involving the use of child labor or hazardous chemicals. These procedures can easily be incorporated into the MFI’s credit manual or risk-management framework.

**Private equity funds** (PEFs) make long-term equity investments in companies (generally small and medium enterprises); those investments will later be sold for price above the amount the PEF invested, thereby yielding a profit for the PEF. Because such transactions make the PEF a partial or full owner of an investee company, the PEF is directly exposed to, and could be liable for, the E&S risks of an investee company. A PEF thus has a keen interest in mitigating potential E&S risks that would otherwise reduce an investee company’s market value and affect the PEF’s timed exit from the company.

A PEF’s ownership gives it a unique position to advocate for sound E&S management and to identify E&S opportunities that enhance an investee company’s financial value. PEFs should apply their ESMS across the investment portfolio during the entire investment cycle, from deal sourcing and due diligence, on through investment agreement, portfolio management, and exit. For portfolio investments involving high E&S risks, an in-depth E&S analysis shall be performed as compared to those portfolio companies having low E&S risk.
Table 1. E&S Impact Areas for FIs

<table>
<thead>
<tr>
<th>Resource Management</th>
<th>Waste Management</th>
<th>Human Capital</th>
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<tr>
<td>Air and Water Quality</td>
<td>Wastewater</td>
<td>Labor and Working Conditions</td>
</tr>
<tr>
<td>Water Use and Conservation</td>
<td>Solid Waste</td>
<td>Occupational Health and Safety</td>
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<tr>
<td>Energy Use and Conservation</td>
<td>Hazardous Material</td>
<td>Community Health, Safety, and Security</td>
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<tr>
<td>Biodiversity and Natural Resources</td>
<td>Air Emissions</td>
<td>Land Resettlement</td>
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<td>Land Acquisition and Contamination</td>
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<td>Indigenous Peoples</td>
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**E&S Risks to FI Clients.** An industrial or commercial client’s exposure to E&S risks are due to improper planning or management of the impact areas as described in Table 1. Such risks may have unexpected implications for the client and jeopardize the client’s financial and operational viability through the following channels:

1) Disruption of operations A client’s operations may be disrupted by changing social conditions such as high staff turnover, protest by communities, or changing environmental conditions such as accidents or deterioration of resources on which the operation depends.

2) Legal issues. A country’s E&S regulations establish requirements for operating licenses, occupational health and safety standards, and emission and discharge permits. A client’s failure or continuous negligence to comply with these requirements will result in fines, penalties and even criminal sanctions.

3) Loss of market share. Due to existing or new E&S regulations or market demands for socially responsible or environmentally preferable products and services, a client may lose market share if it cannot meet these requirements or expectations.

4) Market devaluation. The client may face E&S liabilities such as costly land or groundwater remediation required by environmental regulations. It can also face claims for damages individuals or communities for E&S damages by its operations. This would represent a significant financial burden to the client and result in market devaluation of assets.

5) Poor reputation. With communities’ E&S awareness growing, FI clients face increased public scrutiny for good management and accountability. Poor E&S performance can result in opposition to a client’s presence in the community and operational delays or interruptions. Negative reputation or public perception can decrease demand for clients’ products or services.

**Management of E&S Risks to Financial Intermediaries.** E&S risk associated with a client’s operations as indicated above will likely be passed on to the FI that finances the client in different forms and at different times. Thus an FI’s financing decisions should take into consideration the E&S risks described below.
1) **Liability risk**  By taking possession of collateral assets or involving itself in a client’s business operations, an FI is exposed to liability risk stemming from the client’s legal obligations. This may include fines, penalties, and costs for third-party damage claims for actual or potential land contamination. If the FI is a principal shareholder, it may become directly liable for all E&S risks.

2) **Credit risk**  An FI is exposed to credit risk when a client does not fulfill its contractual obligations to the FI as a result of E&S incidents that reduce the client’s cash flow. Credit risk also arises if a client faces increased costs of complying with mandatory E&S standards, or if absent or expired operating and emission discharge permits result in regulatory fines or penalties.

3) **Market risk**  E&S problems may cause an FI to incur market risk from a reduction in the value of assets or collateral it holds as security in its client companies. For example, if a client’s production site is found to be contaminated, the market value of the client company or the underlying collateral will fall.

4) **Reputational risk**  Negative publicity or loss of reputation associated with a client’s poor E&S practices can harm the FI’s brand value and image in the broad public, including its customers, neighbors, employees, as well as in the business and financial communities, which consequently will affect the FI’s ability to raise funds or do business.

**E&S Risk Categorization.** In assessing and managing clients’ E&S risks, FIs often categorize these risks into different levels to indicate potential E&S impacts and to determine the appropriate level of E&S due diligence and monitoring. The level or category of E&S risks depends on the characteristics of the client activities supported by the FI financing, such as industry sector, size of operation, location, sensitivity, and magnitude of impact.
Many FIs categorize their client activities or projects using three risk levels: Category A represents potentially significant adverse E&S risks or impacts that are diverse, irreversible, or unprecedented; Category B represents medium or potentially limited adverse E&S risks or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures; and Category C represents minimal or low E&S risks.

Table 2 shows examples of activities with different E&S risk levels (A, B, C). A portfolio breakdown by these categories can provide an indication of the overall level of E&S portfolio risks for the FI. There are many ways by which financial intermediaries can mitigate their E&S risks commensurate with their financing activities. Box 1 (above) gives several examples from a range of financial intermediaries.

Understanding and managing E&S risks and impacts will be a defining aspect of success in modern financing activities. As shown in the few cases in Box 2 below, FIs should act now and implement proper systems and procedures to manage E&S risks and prepare themselves for present and future business development opportunities.

**Advantages and Challenges of Environmental and Social Policy of Financial Intermediaries**

**Better Risk Management.** Implementing an E&S policy or an ESMS enables an FI to systematically assess the E&S risk of financial transactions within specific industries or geographic contexts. ESMS implementation also helps an FI understand its exposure to E&S risks in different portfolio subsets.
Although exposure to some level of E&S risk is unavoidable in many cases, an ESMS improves the FI’s ability to control its overall E&S risk exposure, thereby supporting the FI’s long-term business sustainability.

**New Business Opportunities.** Implementing an ESMS is important for risk management. ESMS implementation can also help the FI identify new business opportunities and design new products and services to reduce such risks. These opportunities include the promotion of energy efficiency, renewable energy production and distribution, the manufacturing of pollution-control equipment, green buildings, recycling services, sustainable tourism, carbon trading, and even global market penetration. Opportunities such as these will initiate new partnerships and create a new client base, thus contributing to the overall development of economies.

**Competitive Advantage.** Issues such as good governance, greater accountability, and increased lender liability are relevant to all FIs. FIs that endeavor to address E&S risks can improve their reputation among current and prospective clients, and among the general public. Implementing ESMS can also increase an F’s ability to attract investors, clients, or new business opportunities. Having an effective ESMS is a core competency that an FI can use to differentiate itself from others for competitive advantages.

Increasingly, clients are looking at an FI’s position on E&S issues when deciding where to take their business; investors and lenders, particularly international FIs, are expecting their investee FIs to adopt an ESMS. External stakeholders are pushing FIs to comply with international E&S standards, and policy makers are sending regulatory signals to FIs on improving E&S performances of FI portfolios.

**Challenges.** Understanding and managing E&S risks associated with their financing transactions is still relatively new to many FIs. FIs may see E&S issues as a private matter of their clients that should be addressed by the government regulators. FIs in emerging markets may worry that increased E&S oversight by them or required by their international investors may damage their competitiveness, since there would not be a level playing field among their peers unless a mandatory government policy or voluntary industry-wide self-regulation came into existence. Even though committed, many FIs still face barriers such as the necessary knowledge and in-house capacities in implementing an effective ESMS. For example, in a survey conducted by the International Finance Corporation (IFC 2005b) with a group of commercial bankers, many respondents cited “lack of best practice cases about social and environmental management for financial institutions in the emerging markets” and “lack of know-how/in-house capacity” among the main barriers to their implementation of ESMS.

However, despite unevenness in both playing fields and the implementation of ESMS, there is a clear business case for FIs to think and act strategically regarding E&S risks and impacts in their financing activities and the long-term sustainability of their businesses. FIs that implement an effective ESMS will be better positioned to deal with, and benefit from, the challenges of climate change, environmental
degradation, natural resource depletion, and other
E&S issues that will drive new regulations, and shape
the future market and economy.

Interaction with other Tools

Implementation by FIs of environmental and social
policies and procedures contained in an ESMS
requires the interaction with a number of other
management tools. These include information
disclosure, land use planning, market-based
instruments/economic incentives, occupational health
and safety, and promoting active citizenry.

Modern FIs respond to global drivers by
incorporating or promoting E&S standards or
technologies into their lending or investment
decisions. To facilitate managing their E&S risks, FIs
may want to consider using the other World Bank
Guidance Notes, such as Environmental Information
Disclosure, Environmental Licensing, Land Use
Planning, Market-Based Instruments/Economic
Incentives, Occupational Health and Safety, and
Promoting Active Citizenry.

Box 2. Toward Sustainable Banking: Three Cases from Emerging Markets

Center-Invest Bank is one of the largest regional banks in Russia and serves both large corporations and SMEs. It developed
an ESMS based on IFC’s Exclusion List, project categorization, and applicable local environmental laws and regulations.
During appraisal of new loans, Center-Invest Bank uses environmental impact assessments and site visits to evaluate social
and environmental criteria of funded projects and takes on environmental liability insurance. The bank also routinely
carries out consultations with clients on E&S risk management and, with participation of local E&S authorities, assists in
developing an action plan to mitigate and monitor the identified risks.

The Cuscatlan Group is one of the leading commercial and retail banking institutions in Central America. It has introduced a
comprehensive and well-coordinated environmental management system (EMS), which includes unified annual reports
from all country subsidiaries. The bank makes a continuous effort to mainstream E&S components into overall lending
operations. The EMS contains detailed procedures and checklists for environmental appraisal, screening, and monitoring,
including the requirements of IFC’s Exclusion List. The E&S impacts are analyzed according to the checklist. An
Environmental Action Plan is tailored for each project financed.

The bank also offers innovative products in cleaner production and energy efficiency, and finances projects for
environmental improvements. With USAID as the guarantor, the bank finances and provides guarantees for cleaner
production projects to small and medium enterprises in Central America.

Industrial Bank of China is a joint stock bank with branches across all major Chinese cities. In October 2008, the bank
became the first bank in China to adopt the Equator Principles that are based on IFC’s Performance Standards. Industrial
Bank has established a dedicated Sustainable Development Unit to implement the Equator Principles and developed
internal E&S policy and procedures (ESMS). It has integrated E&S considerations into its credit-review process and trained
loan officers and other relevant staff of all levels in headquarters and local branches. To enlist support from clients, the
bank also reaches out to educate clients on its E&S requirements.

Supporting the clients through sustainability, both Center-Invest Bank and Industrial Bank have grown their businesses in
energy efficiency and other environmentally friendly projects. They are the first bank in Russia and China, respectively, to
offer innovative financing packages to energy efficiency projects that reduce production costs as well as carbon dioxide
emissions. For their pioneering and successful work in such areas, both banks have won multiple sustainability awards,
including the Financial Times-sponsored Sustainable Banking Awards in recent years.
References and Resources on Environmental and Social Policy for Financial Intermediaries


This guidance note is part of World Bank Group publication: Getting to Green – A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org
2.4 Judiciary
Role of Judiciary in Pollution Management*

Introduction

Pollution management typically is the primary responsibility of executive or administrative agencies of government, private sector managers, and operators of public services such as waste collection and treatment. Prevention, control, and management of pollution depend on changes in individual and corporate behavior, including the use of appropriate technology. Some of these behavior changes and technologies may be required or encouraged by law. Government agencies often have a larger and more direct role in management of natural resources, particularly where, as is often the case, the resources are owned by the government.

The judiciary’s role in pollution and natural resource management is secondary to that of executive and administrative agencies. Although secondary, the role of the judiciary is significant – enforcing compliance with rules and standards. Because courts are final arbiters of actions to enforce environmental laws they can be instrumental in promoting compliance. Courts also are often given the role of reviewing the legality of decisions made by administrative agencies. Thus, the judiciary has a crucial and unique role in the management of pollution - ensuring that it operates under the rule of law.

Box 1. World Summit on Sustainable Development

In 2002, prior to the World Summit on Sustainable Development, more than one hundred senior judges from fifty-nine countries adopted the Johannesburg Principles. These set out the judges’ shared understanding of the role of the judiciary with respect to environmental law and sustainable development. They affirmed their commitment to principles of sustainable development, emphasizing the role of the judiciary in “implementing and enforcing applicable international and national laws, that . . . will assist in sustaining . . . an enduring civilization . . .” They further affirmed the principle that “an independent judiciary and judicial process is vital for the implementation, development and enforcement of environmental law; and that members of the judiciary . . . are crucial partners for promoting compliance with, and the implementation and enforcement of, international and national law.”

* This guidance note was prepared by John Pendergrass (Consultant). Peer reviewers included Hocine Chalal (Regional Safeguards Advisor, MNACS) and Johanna van Tilburg (Senior Counsel, Leges). Additional comments and contributions were provided by Alberto Ninio (Chief Counsel, LEGEN), Gael Gregoire (Senior Environmental Specialist, MNSEN), Guillaume Meyssonnier (Environmental Specialist, MNSEN), and Luiz Maurer (Senior Industry Specialist, AFTEG). Editorial assistance was provided by Jenepher Moseley (Consultant), Juliette Guantai (Program Assistant, ENV) and James Cantrell (Communication Analyst, ENV). The task team leaders for this product are Kulsum Ahmed (Lead Environment Specialist, ENV) and Helena Naber (Environmental Economist, ENV). The product was prepared under the guidance of the following World Bank Group management: James Warren Evans / Mary Barton-Dock (Directors, Environment Department, World Bank), Bilal Rahill (Senior Manager, IFC), and Frank Lysy / Ravi Vish (Director, MIGA).

Description and Application of Role of Judiciary in Pollution Management

In civil law jurisdictions, typically based on the Roman legal tradition and in use in much of the world, the role of judges is to apply the laws written by the legislature. In nations whose legal system is based on the British system, referred to as common law jurisdictions, the judiciary has an additional role - establishing rules of behavior and standards for pollution prevention and control. In common law jurisdictions judges apply to new facts the rules of law established by the legislature or by judges in prior decisions. Where the statutes or precedents are not clear, common law judges interpret the rules to fit new situations and, where there is no statute covering a situation, may establish new rules when the prior decisions or precedents do not fit the facts of the case. In both systems courts may be authorized to review actions by administrative agencies to assure they are in accord with statutory rules.

Strict liability, or the polluter pays principle, is another area where the common law contributed to the development of legal rules widely used in modern management of pollution. The English courts first articulated a rule of strict liability for injuries that result from unnatural uses of land or dangerous activities almost a century and a half ago in Rylands v. Fletcher. This rule of strict liability has been adopted by the courts in many common law jurisdictions as applicable to “abnormally dangerous activities.” The general rule is that (1) One who carries on an abnormally dangerous activity is subject to liability for harm resulting from the activity, although he has exercised the utmost care to prevent the harm. (2) This strict liability is limited to the kind of harm,

Box 2. Role of Judiciary in the Tort System

Judges in common law jurisdictions were vitally important in the early development of principles that became the foundations of environmental law through their role in articulating rules of law to apply to situations not covered by statutes. Tort and property law rules developed by common law judges cover aspects of pollution that infringe on the personal or property rights of individuals, including disposal of wastes or pollution that harms another person or her property. Tort law has been used to redress injuries caused by pollution and other environmental injuries. Tort law compensates victims for injuries caused by another party and may also be used to enjoin actions that are causing, or are likely to cause, harm to another. The common law concept of private nuisance protects private landowners, or other persons in possession of land, from any unreasonable interference with their use and enjoyment of the land. A similar, but distinct, doctrine of public nuisance protects the public from activities that would endanger the public health and safety. Both of these doctrines have been applied by the judiciary to remove specific sources of pollution, but are not well designed to manage or control pollution from multiple sources or over a period of time. Tort law is best suited for disputes between individuals or parties that can effectively be treated as single entities. Judge-made tort law is not well suited to establishing and enforcing specific rules of conduct or for regulating the use of common resources such as air and water. For these reasons in civil law nations, as well as many common law ones, legislatures have drafted statutes to establish specific rules of conduct regulating pollution and the use of common resources.

\[2\] Rylands v. Fletcher, 3 H. & C. 774, 159 Eng. Rep. 737 (1865) rev’d in Fletcher v. Rylands, L.R. 1 Ex. 265 (1866), aff’d in Rylands v. Fletcher, L.R. 3 H.L. 330 (1868).

\[3\] See RESTATEMENT (SECOND) OF TORTS §519 (1977).
the possibility of which makes the activity abnormally dangerous.\textsuperscript{4}

This legal concept has become generally accepted throughout the world even as it has become broader in scope and become more widely understood as the polluter pays principle. Legislatures in both common law and civil law nations have enacted laws requiring polluters to pay for the damage they cause to the environment, applying strict liability to many forms of pollution. In addition, the polluter pays principle has been adopted in international treaties and in non-binding international instruments.

\textbf{Administration for environmental justice}

\textit{Environmental law education at universities.} Environmental law is a relatively new topic of instruction in law schools, first gaining acceptance as a topic worthy of specific instruction in the 1970s. Nevertheless many law schools did not begin offering courses in environmental law before the 1990s. Academic institutions are also actively involved in providing instruction about their own national and sub-national environmental laws as well as comparative analysis of other national laws and international environmental law. The International Union for the Conservation of Nature (IUCN) has an Academy of Environmental Law that seeks to develop curricula on environmental law, particularly new topics such as climate change, and assist law schools in providing instruction on environmental law.

\textit{Recruitment, training and permanent education of judicial officers.} The recruitment of judicial officers varies significantly from nation to nation, although many that follow the civil law system have adopted selection systems designed to recruit the most capable legal minds relatively soon after they complete their initial legal training. Another common attribute of many civil law jurisdictions is their requirement, and provision, of additional post-graduate education designed to prepare judicial officer candidates for the unique roles and responsibilities of the judiciary. These judicial academies may provide courses of instruction up to a year in length as well as supervised practical learning experiences with sitting judicial officers. Few such judicial academies, however, include environmental law as a regular part of their curriculum.

The United Nations Environment Programme (UNEP) had initiated a series of regional workshops to educate judges about environmental law, which led to the Global Judges Symposium and the adoption of the Johannesburg Principles in 2002. In the years following the Global Judges Symposium, UNEP developed several important resources specifically for judges: the Judicial Handbook on Environmental Law, authored by Dinah Shelton and Alexandre Kiss in 2005; the Guide to Global Trends in Application of Environmental Law by National Courts and Tribunals; and Judicial Training Modules on Environmental Law in...
2007. It continued to hold regional workshops and partnered with the Environmental Law Institute (ELI) and other organizations, including national judicial education bodies, to educate judges in specific countries.

Other institutions dedicated to education of judicial officers are now providing programs on environmental law such as the American Bar Association Rule of Law Initiative, the Asian Environmental Compliance and Enforcement Network, and International Network for Environmental Compliance and Enforcement.

*Alternative dispute resolution mechanisms.*

Environmental disputes can be difficult to resolve for many reasons: they often involve technical evidence; may involve experts from many disciplines, including multiple scientific fields, economics, and engineering; they may affect or be affected by resources that may be difficult to observe (i.e. atmospheric or subsurface); they may involve multiple parties; and they often involve complex legal issues. The number of environmental cases can also become burdensome, particularly where judges face multiple cases involving one or more of these complicating factors. Courts and parties have therefore explored a number of mechanisms to reduce the burden on judges and the time and expense to parties of prolonged litigation such as:

- **Court-annexed arbitration** means that arbitration of the dispute remains within the judicial system rather than operating as a separate system of dispute resolution as is provided for by some contracts between businesses. Arbitration involves presenting information about a dispute to one or more impartial arbitrators, who then make a final decision that is binding on the parties.
- **Mediation** is intended to facilitate negotiation of a mutually agreed upon resolution of the dispute, though a mediator has no authority to impose a resolution or settlement. The mediator works with all sides and can help them identify alternative solutions.
- **Summary jury trials** were developed by a United States federal trial judge as a method of assisting parties in long, complex cases to evaluate the strength of their case, particularly their estimates of damages. A summary trial involves a non-binding summary presentation by each party to six jurors who deliver a consensus verdict or, if no consensus is reached, anonymous individual verdicts. Even if a complete resolution is not reached, this technique, along with the following two methods, can be useful in narrowing the issues before the court thus reducing the burden on the court.
- **Early neutral evaluation** is another process involving a mutually agreed on neutral party who helps the parties to the dispute evaluate the relative merits of their cases. The parties typically exchange written summaries of the issues, evidence, and views on liability and damage issues. The neutral then holds an informal evaluation session where the parties present their claims, defenses, and evidence. The neutral evaluator then prepares a written evaluation.
of the dispute, which is used by each party to inform its participation on further negotiations, sometimes mediated by the neutral evaluator.

- Judicial settlement conferences may be conducted by the judge presiding over a trial and may be initiated by the judge, and therefore mandatory, or by the parties. They are informal, with no record made, but generally the parties are present along with the attorneys who will try the case.

Specialization of courts/court officers. A relatively small but increasing number of jurisdictions are relying on judges specially trained in environmental law to handle some or all environmental disputes. For example, in June 2009, the environment minister of Indonesia signed a Memorandum of Understanding with the Chief Justice of the Supreme Court providing that the ministry would train 100 judges in environmental law. These judges will be assigned to handle environmental cases throughout the country. A significant challenge for courts is obtaining funds to pay for training for specialization of judicial officers and for operation of environmental courts. Funding to train judges in environmental law has been provide by developed countries, multilateral development banks, and foundations, but funding to operate specialized courts typically must be generated locally.

Access to information on environmental law. Regardless of whether judges have had specialized training on environmental law, they will need access to sources of environmental law. Several excellent sources of information about environmental law are available to those with access to the internet. These include ECOLEX, operated by the International Union for the Conservation of Nature (IUCN), the Food and Agriculture Organization (FAO), and UNEP http://www.ecolex.org/start.php and FAOLEX http://faolex.fao.org/faolex/ (English, French,

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**Box 3. Green Benches (India, New Jersey, USA)**

In the mid-1990s the Supreme Court of India established a three-judge Green Bench typically headed by the Chief Justice, which handled numerous petitions and issued several landmark judgments. The Green Bench sat as often as weekly to hear petitions and oversee work by committees of experts it appointed to investigate and take action on environmental and natural resource issues. In 1996, the Supreme Court directed the chief judge of the Calcutta High Court to establish a Green Bench to hear environmental petitions. Later that year the Supreme Court asked the Chennai High Court to establish a similar green bench. These Green Benches are distinguished from Australia’s Land and Environment Court in that they are not separate courts, but rather a method of concentrating environmental cases before a single bench of judges. As of the end of 2009, however, the Government of India was preparing legislation to create an environmental tribunal as part of a comprehensive scheme to improve enforcement of environmental law.

Also in the 1990s, the Supreme Court of New Jersey adopted a rule requiring the chief judges of each of its districts to designate a judge to handle environmental cases that required expedited treatment. These special environmental assignment judges handle only those cases where the plaintiff alleges there is imminent danger and a need for expedited action by the court.
Spanish, and Arabic). UNEP has also produced three Volumes of UNEP Compendia of Summaries of Environment Related Cases and UNEP Training Manual on International Environmental Law. More general is Global Legal Information Network (GLIN) http://www.glin.gov/search.action a public database of official texts of laws, regulations, judicial decisions, and other complementary legal sources contributed by governmental agencies and international organizations. These GLIN members contribute the full texts of their published documents to the database in their original languages. Each document is accompanied by a summary in English and, in many cases in additional languages, plus subject terms selected from the multilingual index to GLIN.

Regional and sub-regional judicial colloquia / judicial cooperation. Judges in several regions have formed regional colloquia to promote the Johannesburg Principles within their regions.

Professional networks. Several professional networks provide information and other assistance on environmental law and environmental issues to judges and other court officers. IUCN’s Commission on Environmental Law (CEL) is a network of experts in environmental law and policy who volunteer to share their expertise to promote the goals of IUCN’s Environmental Law Programme. The Commission has a Specialist Group on the Judiciary, whose purpose is to share knowledge, experience, and judgments among judges who handle environmental cases.

The International Network for Environmental Compliance and Enforcement (INECE) is a network of professionals engaged in the practice of environmental compliance and enforcement. One of its chief goals is to improve capacity to enforce environmental requirements. It has regional groups around the world.

Specialized Environmental Courts. A recent study suggests that at least 35 nations have adopted some form of specialized environmental court or tribunal. These jurisdictions seek to address many of the challenges the judiciary faces when adjudicating environmental cases. Among the reasons cited for establishing such specialized courts are reducing the time to reach a decision, improve the quality of decisions by increasing expertise of judges, improve uniformity of decisions within the jurisdiction, improve access to justice by identifying a forum to handle environmental claims, reduce backlogs

5 http://www.iucn.org/about/union/commissions/cel/ (last visited January 31, 2010).
6 http://www.iucn.org/about/union/commissions/cel/cel_working/cel_wt_sg/cel_sg_judiciary/ (last visited January 31, 2010).
of cases, and avoiding marginalization of environmental cases because they are more time-consuming or complex.\(^9\) There are countervailing reasons given in favor of retaining jurisdiction over environmental cases within courts of general jurisdiction, including the value of judges bring broad experience to bear on environmental matters that may have economic and social implications, concerns about increased costs of the judicial system, inadequate caseload to warrant investment in personnel, lack of judges with the needed expertise, and concern that the judges may be ‘captured’ by special interests.

A committee studying the general issue of establishing specialized courts in the United States set out the following criteria for evaluating whether such courts are needed:

1. The subject is a focused area of administrative decision-making, which is may be separated from other claims;
2. The area has a high volume of cases, whose diversion might alleviate burdens in generalist courts;
3. There is a predominance of scientific or other technical issues requiring special expertise of decision makers; and
4. Uniformity in agency administration of the program is important.\(^10\)

Environmental litigation typically meets three of these four criteria with the only question being whether a jurisdiction has a high volume of environmental cases. The next question is whether to establish a specialized court or another form of tribunal. A specialized court is a special court within the judicial branch that has the full characteristics of courts within that jurisdiction such as independence, secure tenure for the judges, and judges trained in the field. The Land and Environment court of New South Wales provides a model for such specialized courts. (See examples discussed in Specialized Court box). Some jurisdictions have not been willing to fully adopt this model of a completely separate court, which can be relatively expensive in time and judicial resources, but have identified judges to handle environmental cases. These “Green Benches” may be more flexible in that the judges may be available to handle non-environmental cases if the environmental caseload is not sufficient to keep a court busy. The judges on the green benches are likely to develop expertise through their handling of the cases but the jurisdiction may not invest resources in providing training. India is a notable example of the application of Green Benches and of their flexibility in responding to varying caseloads. (See Green Bench box). Environmental tribunals are specialized decision-making bodies that are not part of the judicial branch of government. Typically they are housed within an administrative agency such as the nation’s environmental protection agency. Such tribunals can be expanded or contracted relatively easily to respond to varying caseloads and, as the experience in the U.S. demonstrates, can be very effective in handling large numbers of cases. The Environmental Appeals Board of the United States provides a model for such tribunals.

\(^9\) Id.
Experience has demonstrated that specialized environmental courts or tribunals are effective in resolving environmental disputes fairly, consistently, and efficiently and in reducing burdens on general courts. Such courts or tribunals are easily justified where there are a significant number of environmental cases and, even where the numbers may not be large may be worthwhile if general judges are having difficulty dealing with the complex scientific, economic, and technological issues.

The poor, disadvantaged, and those living in remote areas often have little access to justice. Courts typically are located in urban areas and lawyers can be too expensive for the poor to afford. Mobile courts can improve access to justice for the poor and those in remote areas by bringing the courts to their locations. Following a model established in Guatemala, mobile courts have been adopted by the Philippines, India, and Bangladesh.

**Box 4. Guatemala and Philippines: Mobile Courts**

Guatemala ended more than three decades of war in 1996 when peace accords were signed. The government and judiciary agreed that judicial reform was an essential aspect of post-conflict reconstruction and social stability. With support from the World Bank the judiciary created mobile courts – courts housed in buses that could take judges, court personnel, and courtroom facilities to people in remote regions. The buses are air conditioned and include facilities for hearing cases as well as for mediating disputes.

Initially mobile courts focused on cases involving the poor, youth, and women, and on reducing backlogs of cases involving these underserved people. The Guatemalan Mobile Peace Courts, for example, have jurisdiction in labor, family, and civil cases involving less than $3,000 (US). They have been credited with improving the perception of accessibility of the justice system to the poor. Recently the Philippine Supreme Court authorized use of one of its Justice on Wheels (JOW) buses to handle environmental cases in an area, the Visayas, known for its rich marine resources and subject to overexploitation of its marine environment. As with the Guatemalan buses, the JOW buses contain two rooms, one for hearing cases and a second for mediation of disputes. By authorizing the JOW to hear and mediate environmental cases in this region court administrators intend to deter violation of environmental law and overexploitation of the resources. In the Philippines funding for the JOW program is provided by local governments, which benefit directly from the reduction of backlog of cases as fewer poor people are held in prisons awaiting trial.

**Prerequisite Factors for Role of Judiciary in Pollution Management**

*Case management systems, standard forms, computerizations etc to improve management of caseloads.* Courts throughout the world are improving their delivery of court services through a variety of methods for reducing unnecessary paperwork and other nonessential tasks. Case management systems developed for other types of cases will be applicable in most environmental litigation. Computerization can be particularly useful for environmental cases that involve large numbers of parties as computers can manage large amounts of data. Judicial
officers must be aware of the limitations of computerization, including that they depend on accuracy in the entering of data.

**Transparency and accountability of the Judiciary.** Transparency is fundamental to the rule of law and applies equally to the judiciary, to the executive, and to legislative authorities. An independent judiciary is also fundamental to effective governance and the rule of law, but does not negate the need for transparency.

**Advantages and Limitations of Role of Judiciary in Pollution Management**

Under both civil and common law systems, the judiciary’s role as an independent arbiter and guardian of the rule of law sets it apart from other tools for management of pollution. It is important for policy makers to recognize that judges are not environmental experts. The initial decisions about what actions are necessary in order to prevent or control pollution generally should be made by executive or administrative officials on behalf of government and facility managers on behalf of pollution generators. Policy makers need to understand the limited but essential role of the judiciary in ensuring that pollution laws are applied fairly and that those subject to the law comply. Judges, however, must also recognize that, although environmental law is relatively new and may be unfamiliar to them, they have a duty to apply their best efforts to that area of the law as they do to any other field of law. Environmental law can be complex and often relies on relatively new and difficult scientific concepts and on technically advanced evidence. Nevertheless, the role of the judiciary remains to ensure the peaceful disposition of disputes, uphold the rule of law, apply, and, where authorized, interpret the law.¹¹

**Box 5. India’s Supreme Court Role in Pollution Management**

In one case the Court ordered the capital city of New Delhi to convert all public vehicles from buses to taxis and auto-rickshaws to run on compressed natural gas (CHG) as a means to reduce air pollution. The court has also ordered mass closures and relocations of industrial facilities out of cities and the construction of facilities to treat and dispose of hazardous wastes. Each of these decisions were made directly by the court rather than in reviewing decisions made by government officials. The Court has stated that it has made these decisions only in the absence of action by government officials, but doing so has required extremely large commitments of time and resources by the court. Because the judges lack expertise in environmental sciences and management they have relied heavily on advisory committees of experts. Although many of the Court’s decisions have been credited with providing immediate solutions to pollution problems, it is generally acknowledged that government officials are better at making decisions concerning the means to achieve environmental goals. Government officials generally have access to more complete information and expertise than judges and can involve other affected or relevant agencies and the public in the decision making process in ways that courts are not well suited to do.

In carrying out its duties described above, the judiciary in both civil and common law jurisdictions must ascertain and apply the rules

¹¹ Dinah Shelton and Alexandre Kiss, Judicial Handbook on Environmental Law, UNEP (2005) at XIX.
of law. These include a nation’s constitution, which in many cases establish environmental rights and responsibilities on citizens and government, national laws (including common law where applicable), and, where applicable, international law. Most nations, regardless of whether they have a common or civil law system, have enacted statutes regulating pollution. As a result the role of judges in both systems is quite similar in cases relating to management of pollution – they all apply the statutory rules to the facts of the case. The core function of judges in both systems is to assure that the law is fairly administered.

Another important role of the judiciary in both systems is to assure that everyone has access to the courts and to justice. In addition to its articulation by judges in the Johannesburg Principles, access to justice has been considered a key element of international environmental law through its inclusion in the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) and other international instruments.

Regardless of whether a nation has a specialized environmental court, the courts will need resources to provide computers and training in their use to judges handling environmental (or other) cases with large numbers of victims or potential defendants and highly technical evidence in order to effectively manage the information and deliver justice to all the parties. Specialized environmental courts are the gold standard for competent, uniform, efficient, and fair enforcement of environmental law by the judiciary. Such courts require a significant investment by a jurisdiction in funding, but also significantly in training and otherwise developing the expertise of the judges assigned to such a court. Costs are likely to be primarily for the salaries of members of the specialized court. If the members are already judges and are not replaced in the general courts the overall salary costs may not increase, but many jurisdictions have found it most beneficial to appoint people with expertise in environmental law or environmental issues, thus adding to the number of judges. These investments may in some situations be directly recouped due to savings in the time and resources of general courts that no longer handle complex environmental cases. In most situations the investment is likely to be worthwhile when broader considerations of administration of justice are considered.

In the absence of specialized courts, non-judicial environmental tribunals can be an effective means of accomplishing some of the goals of specialized courts, particularly uniformity and competence, at a lower cost and in a more flexible manner. Such tribunals are not as efficient as specialized courts because their decisions typically are, as they should be, subject to review by regular courts. Tribunals may be particularly

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13 Shelton and Kiss supra note 2 at 6-7, 8-9.
useful in handling routine cases of enforcement of pollution control laws including establishing penalties and other sanctions, the terms by which a polluter must clean up the pollution and bring its facility into compliance, and the actions it must take to restore damage to the environment. This reduces the need for a reviewing court to immerse itself in the technical details of compliance, clean up, and restoration.

The complexity and novel concepts involved in environmental law mean that the judiciary needs to be trained in environmental law. Such training need only be provided to the limited number of judges who are members of a specialized court, but in the absence of such a court basic training for all judges is important so that they do not misapply this complex area of the law. In time such training will likely be provided to most graduates of law schools, but in the interim specialized post-graduate training for the judiciary is needed.

**Box 6. Case example from Brazil**

Members of the Ministerio Publico in Brazil, for example, oversee the functioning of state and federal environmental agencies to assure they carry out their responsibilities, bring actions against polluters on behalf of the public, and prosecute criminal violations of the law. Attorneys for NGOs often bring cases to prevent or control pollution in the absence of action by prosecutors (though in Brazil the Ministerio Publico will continue such a case even if the NGO drops out of the case). Expert witnesses are often critical in helping judges understand the scientific and technological issues involved in pollution cases. Experts can examine the technical data and provide the judge with an evaluation of the meaning and significance of the evidence. This crucial role means that expert witnesses must be carefully selected for their qualifications and reliability. Although some courts rely on advocates for each side to produce experts who may offer differing opinions about the evidence, many courts appoint independent experts to advise them on the facts without bias from the opposing sides.

Judges cannot administer justice alone, they rely on many others including prosecutors, attorneys for private interests and non-governmental organizations (NGOs), and expert witnesses. Prosecutors typically represent the interests of the public and particularly in many civil law jurisdictions this is a broadly encompassing role.
Practical Examples of Role of Judiciary in Pollution Management

Box 7. Specialized Courts (Australia, Brazil, Philippines, Pakistan, Vermont, USA)

The first court specializing in environmental law was created by statute in New South Wales, Australia in 1980. The Land and Environment Court is a superior court of record that combines several judicial functions in one tribunal. It has an administrative review function whereby it reviews the merits of government decisions on planning, building, environmental, and similar matters. Non-judge experts are employed by the court to undertake this and other non-judicial roles. The court also serves the judicial function in civil and criminal enforcement of a variety of environmental laws and compensation for compulsory land acquisition and Aboriginal land claims. In addition it hears appeals from criminal convictions or sentences under environmental laws from the local trial courts. This court provides the model for specialized environmental courts; it has minimized delay for environmental cases, a major hindrance to the resolution of environmental disputes by courts of general jurisdiction in many nations; it has contributed substantially to jurisprudence on environmental law; and it has provided consistency in implementation of environmental law within its jurisdiction.*

Brazil has at least four federal trial courts, two state trial courts, and one state appeals court designated as specializing in environmental issues. These courts have jurisdiction over civil, administrative, and criminal cases and thus cover the full set of environmental cases.

In January 2008, the Supreme Court of the Philippines designated 117 trial courts as special environmental courts. Of particular note is that the Philippines Judicial Academy is providing special training on environmental law to the judges of these environmental courts. Chief Justice Reynato S. Puno said “All efforts will be undertaken so that the newly designated environmental courts will be manned by ‘green judges’ – skillful judges who not only master environmental laws, but also understand the philosophy of environmentalism and ecologism.”

Pakistan’s Environmental Protection Act 1997 created Environmental Protection Tribunals (EPTs) as the final decision makers on environmental issues, including appeals of decisions by the governmental agencies established to control pollution and promote sustainable development and complaints against alleged polluters. The tribunals are composed of a chairperson and two members and are independent of the government and its environmental protection agency. Five such EPTs have been constituted covering significant areas, but not all, of the country. In 2009, the Supreme Court of Pakistan referred a public interest petition concerning pollution of a lake in Islamabad to an EPT, but first had to note that such an EPT needed to be established for the capitol.

Thailand has also established special environmental courts as a division within the court system.

The state of Vermont in the United States created an environmental tribunal in 1990 to hear appeals of orders issued and penalties assessed by the state’ natural resources agency. The court does not hear environmental damage cases between private parties, which are decided by courts of general jurisdiction.

** Id. at 405 – 409.
In the United States, the federal government and many states have established environmental tribunals within the executive branch of government. The U.S. Environmental Protection Agency (EPA), for example, created the Environmental Appeals Board (EAB) in 1992 to hear appeals of permit decisions by agency officials, decisions by administrative law judges on civil penalties, and other cases specified by various environmental statutes. The administrative law judges and EAB handle the majority of the large number of appeals of penalties imposed by the EPA, reducing the number of cases in the federal courts. Administrative law judges and members of the EAB are attorneys employed by the EPA and are required to follow the environmental statutes, but have a degree of independence as they are separate from the enforcement and permit decision makers.

Many U.S. states also rely on hearing examiners or administrative law judges as initial triers of fact when a person is adversely affected by a decision of the environmental agency. Some states provide greater independence by constituting an office of administrative appeals that is separate from all executive departments and handles appeals from all such departments. Final decisions by such administrative tribunals may be appealed to the courts, federal courts for decisions by the EAB and state courts for those by state tribunals. Federal law generally provides that the federal courts will only consider the evidence produced before the administrative tribunal unless the petitioner is able to convince the court that extraordinary circumstances exist. The courts exercise independent judgment on issues of law. This system has reduced the number of cases reaching the courts and provides parties the benefit of triers of fact who possess expert knowledge of the environmental laws while allowing recourse to courts to determine important legal issues.

India provides an example of how such tribunals may be ineffective because they are subject to the control of the legislative or executive branch rather than the judicial branch. India enacted the National Environmental Tribunal Act in 1995 for the purpose of establishing strict liability for damages from any accident arising from the handling of hazardous wastes and for establishing a national environmental tribunal to hear cases resulting from such accidents. Establishment of the Environmental Tribunal was made dependent on the national government appointing members, which the government has failed to do. References and Resources on Role of Judiciary in Pollution Management.

References and Resources on Role of Judiciary in Pollution Management


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This guidance note is part of World Bank Group publication: *Getting to Green—A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness*, available online at www.worldbank.org
2.5 Active Citizens (Including Civil Society Organizations)
Promoting Active Citizenry — Public Access to Information*  

Introduction  
This Guidance Note analyzes tools that government policy makers and leaders use to engage citizens and promote public action through increased access to information about pollution management. Access to such information empowers citizens to make knowledgeable choices and encourages industry and government to improve performance. By providing information and responding to inquiries, governments can build trust and develop policies that better reflect the public’s interests and needs. These policies are also more likely to be sustainable, reducing pollution’s negative effects on the environment.

What constitutes public access to information will vary across countries. International agreements such as the Rio Declaration, Principle 10 (UNEP Web site) and the Aarhus Convention (UNECE Web site) reinforce a global recognition and commitment to principles of access (access to information, participation, and justice). Such principles are necessary components of sustainable development.¹

Description and Application of Promoting Active Citizenry: Public Access to Information

Governments are increasingly implementing policies and actions that increase public access to information (see figure 1). Categories of tools include legal frameworks for access to information; public disclosure programs; the collection, analysis, and dissemination of environmental information; the media; public education; and broad capacity-building initiatives. Policy makers should start with a diagnostic tool to determine where information is weak, and where systems are non-existent or failing.

¹ Access to information policies are not restricted to countries. For example, a number of multi-lateral development banks have information access policies, such as the Bank’s Access to Information Policy which has set forth a groundbreaking change in how the World Bank makes information available to the public.
Tools for this purpose include The Access Initiative toolkit, The Open Society Institute Access to Information Monitoring toolkit, and UNITAR country assessment tools (TAI Web site).

**Access to Information about Environment**

**Legal frameworks.** Freedom of information (FOI) legislation is one of the most widely used instruments to promote access to information. These laws represent a legal mechanism that ensures the public’s accountability to the public. More than 65 countries have enacted formal statutes guaranteeing freedom of information.

**Public Disclosure.** Public disclosure programs, such as pollutant registers, provide information to the public about harmful chemicals that affect their environment. Through mandated industry reports, these registers inventory potentially hazardous chemicals or pollutants that are released into the air.
land, and water, and track substances that are transferred off-site for treatment or disposal. These online registers enable the public to monitor the behavior of polluters and create an incentive for industry to behave more responsibly. Many countries, including Chile, Sweden, and the United States, have adopted public disclosure programs known as Pollutant Release and Transfer Registers (PRTRs; see OECD Web site) or Toxic Release Inventories (TRIs; see US EPA Web site). In 2000, members of the European Union adopted the European Pollutant Register (EPRTR), which tracks 50 pollutants from more than 12,000 industrial facilities across 36 countries (EC Web site).

Collection, analysis, and disclosure of information. Governments can employ a variety of tools to collect, analyze, and disseminate information to the public. These include State of the Environment reports, a scorecard on pollution, citizen report cards (CRCs), air and water quality monitoring systems, early emergency warning systems, and dedicated government information institutes or centers (CRC Web site; World Bank Web site).

State of Environment (SOE) reports are effective tools for governments to communicate technical data to wide audiences in an informed, easy-to-understand manner using visual charts and graphs. SOE reports can track trends over time and show progress toward stated environmental goals. They are effective tools to inform citizens of broad environmental problems facing the country. However, these reports must be produced in regular intervals and more widely distributed to reach all audiences. Developing associated products, such as teacher’s guides, can strengthen the underlying messages contained in the reports.

“Scorecard: the Pollution Information Site” is a Web site that enables users to learn about pollution levels in their community by typing in their zip code (Scorecard Web site). The site provides geographic rankings and provides information on known health effects from a list of chemicals. The site does not cover all sources of pollution or risks to toxic chemicals, and the information is limited to national data sources.

Citizen Report Cards, or CRCs, started in India in 1994 as a way for the private sector to gather consumer feedback regarding goods and services. The card is essentially a survey of user satisfaction on the quality of different services such as health and education. Scores are applied to different performance criteria, and the overall rating is a quantifiable measure of the quality of services. CRCs have been implemented throughout the world in varying contexts. In general, the media collect information through questionnaires and user feedback for the CRCs. It can take months to implement this tool fully. A similar tool called the community report card incorporates the CRC techniques but includes direct engagement with the service sector through meetings. In this way, feedback is immediate.

Other examples of established systems for public access include the US Air Quality Index (AQI) and the Water Environment Partnership in Asia (WEPA). AQI is only one of many air-quality monitoring systems in the world (AIRNow Web site). The AQI reveals air pollution levels and associated health
effects or risks to a community. The index is a government-supported program that works with multiple government agencies (national and state level) as well as the news media to report conditions related to ozone and particle pollution. The index is calculated for five major air pollutants regulated by the US Clean Air Act. The site does not offer calculations for every US city and can experience gaps in information due to data-collection problems. Maps are sometimes unavailable due to transmission errors.

Water-quality information systems are also important tools to empower citizens to make informed choices about the water they drink and help them challenge polluters and weak government policies. WEPA includes 11 countries in East Asia who promote better water management practices and publish information about facilities that treat water (JME Web site). The WEPA site does not show the possible health effects on a community, nor does it provide information in an easy-to-understand format. It does however detail specific country laws that mandate water quality.

Effects of environmental emergencies can range from small incidents that threaten a local village to widespread national disasters that endanger millions of people. Good emergency warning systems can help by providing immediate, reliable, and accurate information in the face of confusion caused by a disaster or crisis. Citizens can be regularly informed of changing circumstances and respond more quickly when communication systems are in place. The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) works with national and local entities to implement information contingency plans as part of an effective emergency response at the start of a crisis (OCHA Web site).

**Media Training.** Mass media (newspapers, radio, and television) play a central role in monitoring democracy and promoting transparency, accountability, and good governance. In many countries, a free press serves as a communicator for government and as a voice for citizens. Media provide a forum for public dialogue and input. Media can also focus the public’s attention on important environmental matters and consequences of government decisions. Media can strengthen the incentives for governments to proactively distribute information and increase the capacity of the public to demand information. This in turn helps reduce the space for corruption.
The effectiveness of media depends upon the capacity of journalists and the laws that protect freedom of expression. Organizations such as the Institute for Further Education of Journalists (FOJO) and the World Press Institute implement training programs in developing countries that are designed to strengthen the capacity of journalists to report environmental information. In 2009, the Tanzanian government signed a memorandum of understanding with six national media organizations to establish an annual award for journalists who exemplify freedom of access to information. Programs can be especially effective when done jointly with local NGOs. For example, Mexico’s SEMARNAT has joined with four NGOs to develop and publish the *Citizen’s Guide to Access to Information*, produce (and later translate into indigenous languages) a television drama series on the public’s right to information, and host two annual Access to Information Days. This last activity has been done in conjunction with the IFAI (IFAI Web site). In Bolivia, the Ministry of Rural Development and the Environment collaborated with local NGOs to develop a poster detailing the proper code of conduct for public officials regarding access to information.

**Capacity Building Initiatives.** Many information systems are hindered by the lack of stakeholders’ capacity to implement such systems fully. Government officials need regular training on

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**Box 1. Training in Malawi Focuses on Journalists**

A government partnership with a civil society organization looks to media as an entry point for activating citizens in Malawi. Because of greater newspaper and radio coverage of environmental issues, the public is more informed and more involved in issues such as air pollution.

In 2008, the Malawi Minister of Education collaborated with the Centre for Policy and Advocacy (CEPA) to develop five training modules on access issues for practitioners working in print and electronic media. This program was designed to increase environmental information through media reporting and to highlight the importance of the environment and natural resources to livelihoods. Modules focused on the legal and policy framework regarding environment and natural resources in Malawi; investigative journalism and the environment; current environmental issues in Malawi; and government of Malawi environmental programs and projects. Trainings were held in Blantyre and Lilongwe, and participants included representatives from civil society, government departments (Environmental Affairs Department, and Information and Civic Education Department), government media, Malawi television, private radio stations, and faith-based radio stations. Those participants and a network of journalists received training.

Since the trainings, CEPA has reported a significant increase in the number of environment-related articles in the daily newspapers and an increase in inquiries from media practitioners seeking technical advice on access issues. One of the private radio stations also approached CEPA to conduct a program on climate-change issues. This program generated considerable public interest, particularly in rural areas where 75% of the phone-in questions and comments originated.

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*Public Education.* Many governments look to public education programs to engage citizens regarding

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expression. In Malawi, government officials work side-by-side with civil society organizations to raise citizen awareness through increased media exposure of environmental issues (see box 1).
changes in FOI laws and the process for implementing these laws. There is also a need to promote actively a “culture of access,” which in some countries presents a significant departure from old-style “cultures of secrecy.” Programs that establish protocols for openness can help foster better engagement with citizens. Capacity-building initiatives are also important for citizens, who do not always understand what type of information is available or the process for requesting and, if necessary, demanding it. Sometimes the information provided is too technical for public consumption.

Many governments are now collaborating with citizen groups on programs to increase the capacity of government officials to provide access as well as the public’s capacity to demand it. One partnership in Ecuador established a university certificate program that trains public officials how to implement national transparency laws (see box 2).

**Prerequisite Factors for Promoting Active Citizenry: Public Access to Information**

Empowering citizens requires that governments proactively collect, analyze, and disseminate information to the public. Information must be up-to-date, in a format that is easy to understand, and available in the languages of all stakeholders. Information should also be disseminated using different channels to reach the maximum number of stakeholders. Requests for information made by citizens should be permitted in writing or orally, and answered in a timely fashion by the appropriate government agency. Answers should direct the public to information, not just documents. Ideally, information should be provided free of charge or at minimal cost.

**Box 2. Building the Capacity of Public Officials in Ecuador**

A new partnership between civil society and government in Ecuador is strengthening the capacity of civil servants to promote access to information and public participation in environmental management.

In 2008, the civil society organization ECOLEX developed and implemented a training program for public officials and CSO leaders implementing Ecuador’s new national Transparency and Access to Information Law. Working with members of the Secretaría de Pueblos, Movimientos Sociales y Participación Ciudadana, and the Human Rights Program at the Universidad Andina Simon Bolívar (UASB), ECOLEX developed the materials for the ten-week certificate program now offered at the UASB. The first training took place in July 2008 and included 23 government officials from 11 national and state agencies. Participants analyzed current institutional policies and learned how agencies could enhance information access and increase public participation in their procedures, policies, and structures.

While mainstreaming this program into current practice will largely depend on the political will of each institution, ECOLEX has received positive feedback from two institutions, the Ombudsperson and the State General Attorney’s Office. The Ombudsperson wants to offer the training course to members of its regional offices, and the State General Attorney’s Office is considering creating a new environmental division because of their experience in the training program.

Effective access by citizens to information requires proactive government; information that is useful, widely disseminated, and free to the public; and timely response to public requests for data.
Collaborating with civil society organizations (CSOs) can help governments deepen their efforts to promote an active citizenry. CSOs are indispensable in supporting public access to information. They generate independent research, advocate for legal reform, build public demand for information, increase the capacity of the public and government officials through training, promote awareness of best practices, and monitor the implementation of laws. Because of new technologies, they are also able to build on knowledge and best practices from colleagues in other regions.

It is important to note that implementation of principles for promoting public access will vary depending on the political and cultural openness of a society. The tools presented in this Guidance Note require a certain change in the behavior of governments and citizens, that this change can itself pose a challenge to implementation. Financial resources are also essential. Post-conflict countries must address additional challenges of rebuilding basic infrastructure, promoting non-partisan media, and earning the public’s trust.

**Figure 2. Access to Information Prerequisite Factors**

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Since pollution is trans-boundary in nature, governments within an affected region are encouraged to work together to address common concerns. Many of the tools described in this Guidance Note can be implemented at the regional level.

**Limitations of Promoting Active Citizenry: Public Access to Information**

FOI legislation can be weak and is often hindered by a lack of administrative rules and operational policies. There are often wide exemptions to the laws, and many do not require governments to release information proactively in the absence of specific requests. To be effective, FOI legislation should require governments to publish guidelines or instructions for how the public may request information. Exemptions should be limited. Where exemptions apply to a document, its non-exempt parts should be released. Public officials must have the capacity to carry out laws relating to public access and actively promote their implementation.
Public registers of pollutants and polluters are not exhaustive. In many instances, owners of small businesses are not required to report, and only facilities that manufacture certain quantities of listed chemicals are required to report, leaving these facilities off the radar and out of public scrutiny. Finding current data can sometimes be problematic, as registers have varying reporting timeframes. Online registers often exclude remote communities. Finally, while the incentive is there for businesses to reduce individual toxins, many registers do not look at a business’s total impact on pollution. A more inclusive view is necessary, since many businesses have reduced pollutants in one area of activity, such as air pollution, but increased pollutants in other areas, such as generating increased waste. Many different agencies within a single government may collect different types of information. Citizens often experience a lack of coordination between agencies when trying to request information. Some governments, such as Uganda, have responded by establishing single information centers where citizens may obtain information in one location from across all agencies. Other governments, such as Mexico, have established full federal-level institutes with the capacity to develop and implement more elaborate information systems (see box 3). Clear coordination between agencies can result in better, robust

**Box 3. Mexico Creates Central Institute for Information**

Mexico is proving that a centralized institute in charge of public requests for information effectively engages citizens. The system is a model for other countries promoting access to information. Created in 2002 with the passage of sweeping new access-to-information legislation, Mexico’s Federal Institute for Access to Information (IFAI in Spanish) was created as the central communications point for citizens requesting information and the 230 government agencies that provide it.

IFAI is a powerful oversight agency. The autonomous organization promotes transparency, monitors developments in access to information, processes citizen requests for information, and settles disputes between citizens and government bodies over responses to these requests. As such, it functions as an administrative court to review negative responses by executive agencies and as an ombudsperson in charge of strengthening the “culture of transparency” in both government and society.

The public is encouraged to file FOI requests using *InfoMex*, IFAI’s easy-to-use electronic system. The site walks users through the process of requesting and receiving information. Users may also track the status of any request in the system and access information provided to others. Citizens have seen improvements in pollution because of the system. In 2006, information requested regarding a sewerage project in Cintalapa exposed dangerous levels of waste flowing into a nearby town. The project was quickly halted until changes were made to ensure the water was properly treated.

IFAI receives approximately 148 requests for information daily. Since 2003, the agency has processed more than 218,000 requests; however, most of these requests come from the capital metropolitan area. One challenge facing IFAI is how to encourage greater citizen participation from other areas of the country. IFAI collaborates with Mexico’s civil society groups like Iniciativa de Acceso – Mexico to reach citizens through activities such as the Access to Information Day.

*Source*: IFAI Web site.
information systems that are more efficient in the long run. In contrast, uncoordinated systems cost the government more money to implement, lead to serious information gaps, and often result in citizens not receiving the information requested.

**References and Resources on Promoting Active Citizenry: Public Access to Information**


Promoting Active Citizenry — Advocacy and Participation in Decision Making

Introduction

This Guidance Note analyzes tools policymakers and leaders of government can use to engage citizens and promote public action through increased advocacy and participation related to pollution management.

Meaningful public participation enables citizens to provide informed and timely input and ultimately influence decisions that affect their environment. Decisions can range from individual projects (such as the location of a chemical factory) to broader strategic plans, laws and policies (such as permitting regulations). For citizens, participation can include commenting on draft policies, raising concerns at a public hearing, or serving on advisory committees.

For governments, engaging the public in decisions can enhance the quality and legitimacy of decisions. It can ensure fairness in decisions, and give voice to underrepresented groups. For the private sector, public participation can generate demand for higher industry standards and support for better practice. Public participation builds trust between parties and strengthens the capacity of all stakeholders to engage in environmental decisions and policies. When done well, public participation can offer clear benefits for government, the private sector and society. On the contrary, done poorly or failure to provide for public participation can result in conflict and public resistance to new policies.

The ability of the public to participate in decisions that affect the environment can be determined by the willingness of government officials to engage citizens as well as the efforts by citizens to participate. It is important to note that policy decisions are not made in a linear and organized manner. They are complex processes with changing circumstances. For the public to feel that their input is valuable, public participation must be incorporated into the larger culture of decision making. Public participation cannot exist merely as a series of singular events where only the
The loudest voice is heard. There must be an inclusive community of participation where stakeholders have equal voice and play a continuous role in the policy making process.

**Description and Application of Promoting Active Citizenry: Advocacy and Participation in Decision Making**

There is no universal definition for effective public participation. The Aarhus Convention sets minimum standards for public participation including timely and effective notification between parties, reasonable timeframes for participation and at an early stage of the decision making process, availability of relevant documentation free of charge, due account of the outcome of public participation, and prompt notification and publication of the decision (UNECE Web site). A more detailed summary of the Aarhus Convention is available in box 1.

The effectiveness of public participation in practice can be influenced by the quality of the process itself. Government investments in public consultation early in the decision making process and sufficient advance notification and documentation can enhance the quality of the input into the decision. Often the public is consulted too late in the process to make any difference in the decision. This can erode trust and negatively affect the willingness of the public to participate in future consultations. Participation should also include a variety of stakeholders including civil society organizations, local experts and underrepresented groups such as the poor.

When systems are accessible, the public has knowledge about where to go to participate, and how to participate. They also know the process for making the decision, and the impact of their participation on the decision. Governments should make every effort to provide advance notice of consultations, in multiple locations, targeting a variety of affected stakeholders. In-person consultations should be held in known, easy-to-reach locations. Electronic consultation should utilize widely used information and communication technology such as telephones (cell or landline) or the Internet. The public should have advance access to documents that summarize the project or policy under consideration. Documents should include full environmental impact assessments (EIAs) or management plans and any related documents. Governments should ensure that documents are in the appropriate language, and adapted for public consumption. This does not imply that information is not disclosed, but that the information is shared in a format that is useful to citizens. Following consultations, there should be a feedback mechanism that notifies stakeholders the outcome of the process.
Box 1. The Aarhus Convention

Hailed as a benchmark in environmental democracy, the Aarhus Convention is a unique global instrument that establishes minimum standards for promoting access to information, public participation in decision making and access to justice in environmental matters. It was negotiated by governments of Europe and entered into force in 2001. Today there are 42 parties to the Convention (2009).

Highlights:
Convention is open to all members of the United Nations.
It enables every person (regardless of citizenship or nationality) to have a say in decisions that affect the environment.
The Convention empowers members of the public to hold governments accountable and become more active in promoting sustainable development.
It recognizes every person’s right to a healthy environment today and in future generations.
It creates a unified legal framework that guarantees citizen access rights across Europe and Central Asia.
The rights protected by the Convention are respected by all “public authorities” including government bodies from all sectors, at national and local levels (except judicial and legislative bodies), public and private bodies performing public administrative functions or services (such as providers of electricity or natural gas) and institutions of regional economic integration organizations that become Parties.

Challenges:
Change can be slow for long-established democracies. Newer democracies however have adapted systems more quickly.
More capacity is needed to establish effective legislative frameworks, set-up institutional structures, train officials in how to apply the Convention and teach citizens how to exercise their rights.
Slow implementation can paralyze the work of an administration. Governments must introduce detailed national implementing legislation and procedures.
- Governments need to better harmonize Convention requirements across all departments, not just those pertaining to environment.
- Wide perception that Aarhus Convention is a regional instrument, not a global one.

Participation can take a variety of forms depending on the decision to be made, time and resources available, or political circumstances. Together they form a continuum based on the extent of the involvement and role in decision making. Common forms are illustrated in Figure 1.
### Figure 1. Common Forms for Advocacy and Participation

**Advocacy & Participation: Common Forms**

<table>
<thead>
<tr>
<th><strong>Legal frameworks</strong></th>
<th><strong>EIA</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic tools</td>
<td>Stakeholder Analysis</td>
</tr>
<tr>
<td>Passive</td>
<td>Press conference, radio</td>
</tr>
<tr>
<td>Consultative</td>
<td>Focus group, town hall</td>
</tr>
<tr>
<td>Power shared with citizens</td>
<td>Advisory Council</td>
</tr>
<tr>
<td>External</td>
<td>Water Association</td>
</tr>
</tbody>
</table>

**Legal frameworks.** Many countries have laws and policies that require public participation. This can include constitutional guarantees; conditions for notice and comment in sector policy-making; and provisions in environmental impact assessments (EIAs). National constitutional reform provides an ideal entry point for establishing public participation systems. Many countries such as Bolivia, Nepal, Thailand and Uganda have used constitutional reform as a way of strengthening the public’s right to participate in environmental decision making. Public participation in sectoral policies helps integrate citizen concerns into decisions related to energy, water, and other sectors that are prone to pollution. Provisions for participation in EIA should explicitly require public comment and notice at various stages of the decision making process. Participation should be required before final approval of the EIA and be included in monitoring compliance of EIA mitigation measures. Laws should apply to both public and private sector development activities.

**Diagnostic tools.** Diagnostic tools such as stakeholder analysis, institutional analysis, and social impact analysis are used to identify key stakeholders and target groups early in the policy process. These can help reveal the broad range of social impacts and potential responses in relation to the policy. This in turn can save critical time and resources early in the process.

**Passive forms of participation.** Some forms of participation are passive with information exchanged from one party to the other. This can include document distribution, press conferences, radio and television programs, and some websites. New technologies enable decision makers to reach a large
numbers of citizens quickly. These forms of participation provide transparency, increase accountability of decision makers, enhance the legitimacy of decisions and build the capacity of the public. They do not however solicit input from targeted stakeholders or seek to incorporate public input into a decision.

Consultative forms of participation. More consultative forms of participation include the establishment of focus groups, town hall meetings, public hearings and workshops. Here citizens participate in dialogues where the intent is to gather feedback for a particular decision. These meetings provide a forum where stakeholders inform each other of their views and opinions, local concerns are identified, public support is generated and collaborative partnerships between groups are fostered. Citizen report cards and community scorecards are also monitoring tools that enable the public to provide feedback on public services. (See chapter on citizen access to information for more information).

The National Pollution Prevention Roundtable (NPPR) is the largest membership organization in the United States devoted exclusively to pollution prevention. It provides a national forum to promote decisions that avoid, eliminate, or reduce pollution at the source. Members participate in work groups and act as advisors on documents, reports and legislation. Members include pollution prevention experts from state and local government programs, small business networks, citizen organizations, industry associations and federal agencies among others (NPPR Web site).

Participation where power is shared with citizens. In some participation models, decision making powers are shared with the citizens. This is useful when external knowledge and capacity is critical for reaching the policy objective. This enables stakeholders to directly influence the outcome of the decision. Examples include: advisory councils, task forces, and referenda. In Brazil, the municipality of Porto Alegre invited citizens to participate in decision making for municipal budgets. The program was so successful that it is now being replicated in other municipalities around the world. (See box 2).

Box 2. Participatory Budgeting in Brazil

In 1989, the Brazilian municipality of Porto Alegre relinquished decision making over municipal budgets to citizens. This included decisions on overall priorities, choices for investment, and citizen assemblies. Through local meetings, citizens identified spending priorities and elected budget delegates to represent their communities. These delegates then developed specific proposals that were later approved by the citizens. The public was ultimately responsible for determining school budgets, housing project budgets, etc. Studies suggest that participatory budgeting can lead to more equitable public spending, increase public satisfaction over decisions taken, greater transparency and accountability, and improved livelihood. In the case of Porto Alegre, the initiative generated increased citizen participation (especially among marginalized groups). Since 1989, participatory budgeting has expanded to more than 1,000 municipalities across Latin America, Europe, Africa and Asia.
External forms of participation. There are some forms of participation that occur outside a structured setting. These include external actors that carry out policy mandates without government oversight or involvement. This can include local natural resources management committees or water associations.

The Citizen Watershed Monitoring Network in Monterey Bay California, started by the Ocean Conservancy, the Costal Watershed Council and the Sanctuary’s Water Quality Protection Program, serves as a forum for local citizen monitoring initiatives. The network empowers community citizens to become active stewards of the watershed by providing guidance and training for public data monitoring (for example measuring water quality and sediment load in streams). The network increases communication between citizens and local government authorities. Local authorities use information gathered by citizens in efforts to protect the watershed (Monterey Bay Sanctuary Citizen Watershed Monitoring Network Web site).

There are significantly more opportunities for the public to participate in project level decisions. For decision makers too, it is often easier to cultivate an active citizenry when projects are known to directly affect those in the community. Some common ways to engage citizens at the local level include: EIA, citizen task forces; public meetings; workshops; questionnaires and interviews. Participation is not limited to the decision itself but continues into the implementation and monitoring stages of the project or policy.

**Prerequisite Factors for Promoting Active Citizenry: Advocacy and Participation in Decision Making**

There are strong links between access to information and public participation. Participating in a meaningful way requires that citizens have adequate access to full documentation for a given project or policy. (See chapter on citizen access to information). Establishing a robust information system will enable (and encourage) citizen involvement in decision making processes. Likewise, as the chapter on citizen complaint highlights, citizens must also know that there is a mechanism set up for grievances.

Local decision makers must be able to clearly identify what citizen input is needed and when in the process it is most useful. They should be specific about defining the “affected” public and not exclude disadvantaged groups. They must carefully assess the power relationships at work. The most dominant voice in the room should not be the most influential. Decision makers should also acknowledge the need for resources. In some cases, a public education program may be needed to provide sufficient background information on the subject being discussed. Citizens should have a thorough understanding on how their input will be used and receive notification of the final decision.
Advantages and Limitations of Promoting Active Citizenry: Advocacy and Participation in Decision Making

It is important to note that even the most effective public participation has limits. It should never be a substitute for equal and fair representation. Participation can reveal choices to be made, but cannot be a substitute for the ballot. Not every person is able to participate in every decision and elected officials must be permitted to represent constituencies. It is therefore important to engage the public when they will be more likely to impact decisions. Extensive reliance on citizen input can also undermine the responsibilities of legislative bodies whose role include checks and balances to other executive bodies. Public participation itself cannot provide accountability it can hold only officials accountable for decisions made.

Public participation can also increase the representation of citizen interests in legislative processes. It can increase public acceptance in new laws or policies. However maintaining consistency in practice across regions and over time can be a challenge. More countries need guidelines at the national level and procedures at the local level.

Finally, simply setting up mechanisms for participation will not necessarily guarantee a public voice in decision making. In the case of Colombia, NGOs are included in the boards of regional agencies (Autonomous Regional Corporations or CARs) and are included (along with members from academia) in formulating policy formulation as a part of the National Technical Advisory Council. Both groups are supposed to represent the public on issues related to environmental policy. In practice however, they have experienced difficulty in attracting participants to the meetings; cultivating technical expertise and securing financial resources. Capacity and coordination are weak. The Technical Advisory Council, in particular, is dominated by the private sector.

Interaction with other Tools and Possible Substitutes

Opportunities for public participation at the strategic, planning or policy level are not as extensive. They require more time and resources and the consultation is often more comprehensive. However the result can lead to better broad policies that can positively affect the implementation of specific projects. Tools such as Cumulative Impact Assessments (CIAs) and Strategic Environmental Assessments (SEAs) are used to solicit stakeholder input in programs or plans. CIA can provide an entry point to initiate stakeholder discussions, increase awareness and strengthen institutional capacity and complement more conventional analyses. SEA’s approach is more upstream and its reach is broader addressing wider regional or sectoral impacts. All can result in more strategic policies.
Practical Examples of Promoting Active Citizenry: Advocacy and Participation in Decision Making, and Lessons Learned

**Estonia.** In 2001, Estonia launched the “I Decide Today” campaign to foster citizen participation. The E-government initiative enables Estonian Ministries to upload draft bills and amendments so that citizens can review, comment and make proposals on the legislative process over a 14-day period. They can also respond to comments already submitted and provide suggestion for additional amendments. At the close of the commenting period, all remarks go back to the Ministry for review. Revised legislation is made public and registered users of the system may vote in support. While the system has not been as effective as hoped (not as many users as expected), it nonetheless encourages regular citizen participation and monitoring of national laws.

**Indonesia.** In the late 1990s, an SEA for a loan adjustment in the water sector undertaken in Indonesia resulted in a shift in the way public participation was used in policy reform. The pilot SEA came at a time when the country’s water sector was plagued with problems: very little interagency coordination, poor accountability and lack of public participation in the face of rising water costs, watershed degradation and increased water pollution. The aim was to address a broad set of policy and institutional reforms in the water sector including the potential consequences of such reform and associated environmental risks. The assessment also prescribed mitigation and monitoring procedures to reduce any adverse impacts.

The SEA was prepared by the Indonesian National Development Planning Agency and a task force made up of multiple agency representatives (at various levels) working together. This created an opportunity for greater policy considerations and horizontal accountability. The group held a series of successful public consultations at the national, provincial, district and local levels. Local facilitators and NGO's with expertise in environmental and social issues were engaged. Representatives from different sectors in the reform process were also included. Benefits and risks were discussed and alternative policy options were identified. Nearly all the environmental risks that were identified were attributed to institutional and governance issues.

At the end of the process, many of the suggestions that were raised were incorporated into the final design of the loan’s reform agenda. The process also led to the introduction of participation in policy reform. The SEA experience led task force and sector agencies to include public consultation in future reforms. This signaled a major shift in the way public participation was viewed in shaping policy.

**South Africa.** In 2003, with support from the World Bank and Canadian CIDA, the Southern African Institute for Environmental Assessment (SAIEA) initiated a project to enhance democratic reform through increased public participation in decision making processes.

The Calabash Project is a research and civil society capacity building program designed to increase the effectiveness and ability of civil society to participate...
in decisions that affect the environment. The program works with communities and regulators to identify opportunities for civil society involvement in the environmental impact assessment (EIA) process. In its initial phase, the project engaged a core group of people identified as key levers of change in the region, developed a 30-person Advisory Team, published an assessment of participation and EIA in the region that identified strengths and weaknesses and opportunities for improvement, and developed a communications strategy to broadcast results of the program.

Calabash has also developed tools for integrating environmental planning, assessment and management into community-driven development. These include: A Guide to Opportunities for Public Participation in Environmental Assessment in the Southern Africa Development Community; Generic Public Participation Terms of Reference; and an electronic library of public participation and civil society engagement (SAIEA Web site).

**United Kingdom.** The United Kingdom Environment Agency publishes environmental data through “What’s in your backyard?” a GIS Internet based portal for public consultation. The easy to use site details open and closed consultation periods, provides a summary of the issue, links to relevant documents, and provides a series of questions intended to guide responses. Questions such as “Is it clear where you can find out about applications we receive for environmental permits?” and “Do you agree with our proposal to advertise applications for environmental permits?” The site offers clear instructions on how citizens may comment and procedures following the comment period (United Kingdom Environment Agency Web site).

### References and Resources on Promoting Active Citizenry: Advocacy and Participation in Decision Making


Promoting Active Citizenry: Public Access to Redress and Legal Recourse*

Introduction

This Guidance Note presents tools that government policy makers and leaders may use to engage citizens and promote public action on matters relating to pollution by providing public access to complaint mechanisms, and by providing public access to legal recourse. Appropriate complaint mechanisms provide the public with avenues for seeking redress of their grievances relating to pollution.

Description and Application of Promoting Active Citizenry: Public Access to Redress and Legal Recourse

Public access to redress and legal recourse can be a powerful tool for pollution management, since it provides a means for individuals and organizations to access a country's justice system as a means to protecting the environment. Access to redress and legal recourse makes it possible for the public to hold decision makers in the public sector and those in the private sector accountable for their actions. There are multiple approaches governments can use for increasing public access to redress and legal recourse. These approaches include legal frameworks (legislation and regulation), capacity building, alternative dispute resolution, legal aid, citizen monitoring and enforcement, and international networks.

Prerequisite Factors for Promoting Active Citizenry: Public Access to Redress and Legal Recourse

Governments can facilitate citizen access to justice by establishing clear information and participation laws that provide adequate legal grounds for citizens seeking redress (see Guidance Notes on citizen access to information and public participation for more information).

Programs that build the capacity of officials, judges, and citizens to effectively use complaint
mechanisms and legal recourse can bolster citizen involvement. Governments can also expand the processes used for redress to include administrative courts and alternative dispute mechanisms. Government-sponsored legal aid also helps defer the costs for citizens and groups to lodge a complaint.

Comprehensive systems providing access to information and public participation are most effective when citizens and government officials (administrative, legislative, and judicial) have a thorough understanding of the laws and its practice.

Rule of law is a fundamental requirement to ensure public access to legal recourse institutions. In the absence of rule of law, seeking legal recourse lacks legitimacy and dissuades active citizenry.

**Box 1. Access to Redress and Legal Recourse**

<table>
<thead>
<tr>
<th>Awareness of legal rights</th>
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</thead>
<tbody>
<tr>
<td>Understanding of procedures and processes</td>
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<tr>
<td>Timeliness of claims processing</td>
</tr>
<tr>
<td>Reasonable costs in litigation</td>
</tr>
<tr>
<td>Accessibility of courts</td>
</tr>
<tr>
<td>Ability to bring a case to court (standing)</td>
</tr>
</tbody>
</table>

**Advantages and Limitations of Promoting Active Citizenry: Public Access to Redress and Legal Recourse**

The ability of citizens to seek redress or challenge decisions is a fundamental element of good environmental governance. Box 1 identifies the foundational components for public access to redress and legal recourse. Public access to redress and legal recourse allows citizens to protect their rights to information and participation, and to dispute decisions that do not take the interests of the community into account. When citizens are able to hold decision makers accountable with regard to environmental decisions, the monitoring and enforcement of regulations is enhanced, the interests of underrepresented stakeholders are better protected, and disputes over natural resources are more likely to be resolved.

In many countries, citizens encounter barriers when they try to access administrative and judicial proceedings. Among the barriers that citizens encounter are the following:

- lack of awareness of legal rights and remedies;
- lack of understanding of the processes for engaging the system;
- significant delays in the processing of claims;
- high costs of litigation;
- geographic location and physical accessibility of the courts, especially if a case is sent to the country’s high court; and
- lack of ability to bring cases to court or lack of standing.
Interaction with Other Tools and Possible Substitutes

Policy tools relating to public access to information, and policy tools relating to public advocacy and participation in decision making, are the tools that most interact with public access to redress and legal recourse (see Guidance Note on public access to information and Guidance Note on public advocacy and participation in decision making). Conventions such as Aarhus (UNECE 2006) and global mechanisms such as the World Bank Inspection Panel (see World Bank Inspection Panel Web site) are especially important in resolving trans-boundary pollution cases. These instruments encourage harmonization of policies and practices among countries, and provide a forum for global citizens seeking justice.

Practical Examples of Promoting Active Citizenry: Public Access to Redress and Legal Recourse, and Lessons Learned

Figure 1 identifies approaches to redress and recourse, and provides examples of the approaches.

**Legal frameworks.** Legal frameworks include laws and regulations. In the context of promoting active citizenry as a tool for pollution management, two important examples are freedom of information legislation (Freedom of Information Act, FOIA) and Environmental Impact Assessment (EIA) regulations. For further information, see the Guidance Note on promoting active citizenry: public access to information and the Guidance Note on environmental impact assessment.

**Building capacity for government and citizens.** Many governments are investing in public education programs and judicial training to build their government’s capacity to provide access and encourage citizens to demand it. Latvia recently established a program to train judges on implementing national access laws (see box 2). Collaborating with civil society organizations can increase the reach of these programs and the expertise used to develop them.
The Ecuadoran Center for Environmental Law (CEDA, Centro Ecuatoriano de Derecho Ambiental; see Cárdenas 2006) is a nonprofit organization established in 1996 by lawyers with the goal of promoting national and international legislation as a means to protect the environment. The group has led many capacity-building workshops throughout Ecuador, training more than 2,500 representatives from civil society, academia, and central and local governments on access to justice (Cárdenas 2006). The group also reviews litigation cases where citizen access rights have been denied and drafts policy recommendations to government. Groups like CEDA help ensure that citizens are aware of their rights and have access to legal recourse, which has resulted in a more active community.

**Alternative dispute resolution (ADR).** ADR is a means, outside the formal legal system, for resolving disputes. It can include negotiation, mediation, neutral evaluation, and arbitration. For citizens, ADR is often an affordable, accessible, and faster means for resolving disputes between parties. For governments, ADR offers an equitable, flexible, and direct means to address and resolve disputes. It also helps alleviate backlogs in the courts and increases access to justice for poor and vulnerable communities (see ADR Center Web site).

In Ghana, ADR is a part of the adjudicating process of the Judicial Service of Ghana and available to parties who file cases in the court. In the first two years of the program, more than 151 mediators were trained and assigned to 41 district courts throughout Ghana. Of the cases referred to mediation in these courts, approximately half were successfully resolved. Today the program is expanding to all district, circuit, and high courts (see Judicial Service of Ghana Web site).

The Alternative Dispute Resolution Center at the International Law Institute (ILI) offers seminars in mediation and arbitration law and practice for government officials, lawyers, judges, and the private sector. It also offers a program in international commercial arbitration at its center in Uganda and has trained mediators and arbitrators in Chile, Egypt, Ghana, Kenya, Nigeria, and Turkey. The group has also advised lawyers and government officials on the drafting of laws and ADR mechanisms in Armenia, Bulgaria, and the Republic of Georgia.

**Legal aid.** In many countries, the high cost of representation is a barrier to citizen participation in the legal system. Legal aid programs help ensure more equitable public access to justice regardless of the economic status of those involved. Public interest organizations often provide legal services free or at reduced cost. Governments can provide
incentives for attorneys who participate in these programs. Such incentives include tax breaks, subsidies for services, expense waivers, or attorney compensation after a trial.

Earthjustice, formerly called Sierra Club Legal Defense Fund, is a nonprofit public interest law firm dedicated to defending citizens’ rights to a healthy environment. Earthjustice monitors US environmental law, and this organization challenges authorities who fail to enforce the laws and industries that break them. Earthjustice works on behalf of local communities and environmental groups, providing free legal services (see Earthjustice Web site).

Australian Network of Environment Defender’s Offices (ANEDO) provides legal services and environmental education directly to communities that would otherwise not have access to such services. In 2006, ANEDO established an Indigenous Engagement Officer position to provide free legal support for indigenous communities. In 2008, the group defended critical water rights for indigenous populations and raised concerns over the lack of participation of these communities in consultations for the nation’s Water Amendment Bill.

Citizen monitoring and enforcement. A well-informed and active public leads to increased demand for transparency and accountability on the part of decision makers in government and industry. The result is better enforcement of environmental laws and policies. Through independent monitoring, citizen groups involved in monitoring and enforcement elevate citizen voices and help ensure improved industry compliance with environmental laws. These groups also alert government to possible violations of law and potential threats to public health. This is especially true in the case of Pollutant Release and Transfer Registers (PRTRs) and other public disclosure schemes that are addressed in the Guidance Note on citizen access to information.

In some countries, like Estonia, governments have contracted citizen groups to assist in local inspection efforts. These contracted “public inspectors” monitor compliance with laws, regulations, and permits relating to hunting, fishing, and forestry, and document any violations they encounter. In Poland, the Nature Protection Guard is comprised of citizens who have powers similar to forest rangers. They enforce local conservation laws and have the right to ticket violators and impose fines. Article 16 of the Mexico Constitution grants citizens the right to arrest any person caught in the act of committing an offense.

The Chemical Weapons Working Group (CWWG) is an international coalition comprised of citizens who live near one of nine storage sites for chemical weapons in the United States, Russia, and the Pacific. The group opposes incineration of chemical weapons and works with policy makers to ensure safe disposal of these munitions, and of other chemical warfare and toxic materials. As governments comply with international obligations to dispose of chemical weapons, CWWG works to ensure that this is done safely and in a transparent manner. In 1996, CWWG successfully convinced the Pentagon and Congress to use $300 million dollars
for the safe disposal of more than 880,000 chemical weapons in the US.

acknowledgement of the negative health impacts of pollution and a commitment to relocate citizens who were exposed to toxins. See box 3.

**Box 3: Protecting Citizens from Pollution**

Started in 1989 by a handful of lawyers, Environmental Law Alliance Worldwide (ELAW) now connects more than 300 public interest advocates across 60 countries. The network promotes effective environmental protection through law using common strategies and shared legal and scientific experiences. Partners work with citizens to challenge environmental abuses, strengthen environmental laws, and build local capacity to defend the environment.

In 2005, ELAW US helped win an important ruling from the European Court of Human Rights on pollution-related illnesses. The group presented compelling scientific evidence showing that Nadezhda Fadeyeva, a Russian citizen who lived near the Severstal steel plant, suffered serious health problems as a direct result of the plant’s toxic emissions. The court ruled that the factory’s pollution violated Mrs. Fadeyeva’s human rights and ordered the Russian government to uphold its 1965 commitment to relocate citizens living in the “security zone” around the plant. The case reaffirmed that people have a human right to live free from toxic pollution and opened the door for more citizens to pursue justice.

**International networks.** The rapid growth of environmental civil society organizations in recent years has led to a rise in international networks, partnerships, and collaborative efforts across borders. Armed with modern technology and expertise, these groups help promote citizen engagement in environmental legal matters. New technological tools like Facebook and Twitter help groups to connect with citizens and to share up-to-date information at an unprecedented rate. Some groups are formal organizations, while others are ad hoc. Some exist outside the state, while others may have quasi-state status.

Sometimes, groups act on behalf of citizens, without any broad public mandates. In India in the 1990s, two Civil Society Organizations (CSOs) brought public interest lawsuits that compelled the government to enforce, and be accountable to, legal requirements regulating air pollution. The CSOs were highly successful in their pursuits; however, the groups themselves did not represent the opinions of the broader public. Both groups were self-appointed to protect the interests of the public, but neither had any mandate nor any groundswell of public support. Essentially, they were small elite organizations, and local citizens were informed of the lawsuits rather than involved in them.

Table 1 presents a summary of means to promote active citizenry through public access to redress and legal recourse.
Table 1. Summary of Means for Promoting Active Citizenry through Redress and Legal Recourse

<table>
<thead>
<tr>
<th>Category / Resources</th>
<th>Example</th>
<th>Description</th>
<th>Application</th>
<th>Pros</th>
<th>Cons</th>
<th>Good practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal frameworks</td>
<td>FOIA, EIA</td>
<td>Laws that guarantee the public’s right to participate in decision-making.</td>
<td>National, provincial, and regional levels.</td>
<td>Legally binding, enforceable right to legal redress.</td>
<td>Laws can be weak, lack administrative rules and operational policies. Wide exemptions.</td>
<td>Laws should provide citizens adequate grounds for redress and include administrative rules, operational policies.</td>
</tr>
<tr>
<td>Capacity building for government and citizens</td>
<td>Training programs for judges</td>
<td>Initiatives to enhance government officials’ ability to implement laws and build citizen awareness of rights.</td>
<td>Workshops, certificate programs.</td>
<td>Ensures broad implementation of laws, wide use by citizens.</td>
<td>Can take time to design, implement. Significant start-up costs.</td>
<td>Government partnership with civil society organizations and universities to create and implement programs.</td>
</tr>
<tr>
<td>Alternative dispute resolution</td>
<td>Ghana Judicial Services; Alternative Dispute Resolution Center</td>
<td>Means to resolve conflict outside the formal legal system.</td>
<td>Includes negotiation, mediation, neutral evaluation and arbitration.</td>
<td>An affordable, accessible and faster means for resolving disputes. Alleviates court backlogs, increases access to justice for poor.</td>
<td>No &quot;checks and balances&quot;, sometimes used by people who are not trained in the collection of evidence. Non-traditional approach may be inappropriate for some cases.</td>
<td>ADR has wide public acceptance and government support. Sufficient funds, training and evaluation provided. Voluntary, flexible and expeditious.</td>
</tr>
<tr>
<td>Legal aid</td>
<td>Australia EDO; Earthjustice; government programs</td>
<td>Programs or groups that provide low-cost or free legal assistance to citizens.</td>
<td>Free legal services, government incentives (tax breaks, subsidies) for participating attorneys.</td>
<td>Citizens are able to exercise right to legal recourse regardless of financial stature.</td>
<td>Increase in legal cases contributing to backlog in courts.</td>
<td>Aid reaches those most in need of services. Administrative and court fees are not barriers to justice. Independent legal representation is available, accessible.</td>
</tr>
<tr>
<td>Citizen monitoring and enforcement</td>
<td>Chemical Weapons Working Group</td>
<td>Programs or groups that monitor laws and inform citizens of policies and industry compliance.</td>
<td>Informed citizens alert government of possible violations of law.</td>
<td>Enhances industry accountability, transparency. Alerts authorities to public health threats, early warning.</td>
<td>Can be viewed as threatening to industry and government.</td>
<td>Mutually beneficial relationships between citizen groups, industry and government. Collective support.</td>
</tr>
<tr>
<td>International networks</td>
<td>ELAW</td>
<td>Partnerships that promote citizen engagement in legal matters.</td>
<td>Some groups are formal organizations and others are ad hoc. Some have quasi-state status.</td>
<td>Rapid learning across different legal systems, countries. Emergence of international best practice. Ability to mobilize large stakeholder groups.</td>
<td>Groups may act on behalf of citizens without any broad public mandate.</td>
<td>Action based on common strategies and shared legal and scientific experiences. Broad public support.</td>
</tr>
</tbody>
</table>
References and Resources on Promoting Active Citizenry: Public Access to Redress and Legal Recourse

Access Initiative, www.accessinitiative.org
--------, “Diagnostic Toolkit,” http://accessinitiative.info/
ADR Center, “ADR and Access to Justice,” ADR Center,
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This guidance note is part of World Bank Group publication: Getting to Green – A Sourcebook of Pollution Management Policy Tools for Growth and Competitiveness, available online at www.worldbank.org