

Managing Environmental Risks

A V Vedpuriswar¹

Environmental risk is the possibility of harm to people and the environment owing to human activities. A good example is the Bhopal gas tragedy of 1984, which exposed the tremendous risks associated with poor safety and environmental management practices. Thousands of people lost their lives after Methyl isocyanate gas leaked from the plant and several thousands more were injured and left homeless. Memories of Bhopal are still alive in the minds of most Indians.

Bhopal served as a warning to corporations that they needed to take their environmental responsibilities far more seriously than they had been doing till then. Environmental disasters have however, continued to occur subsequently at regular intervals like the Chernobyl Nuclear disaster of 1986, the Valdez oil spill of 1989 and the Tokaimura (Japan) nuclear accident of 1999. In developing countries like India, environmental issues often take the back seat and accidents are quite common.

Many companies equate environmental risk management with regulatory compliance. In actual practice, there is much more control and discretion when it comes to environment related expenditures, than commonly assumed. Not only is regulation subject to numerous interpretations but also what constitutes compliance is often not very precise. Over designing products and processes to eliminate risk may often not be the optimum solution. At the same time, a carefree non caring attitude is dangerous as events like Bhopal have highlighted.

In short, the time has come to integrate environmental performance into business strategy. As Merkl and Robinson² put it, "Despite the scale of the problem, most corporations do not manage the environment as an integral part of their everyday activities. Because of legal and technical complexities and the

emotional and public relations baggage associated with environmental matters, basic business principles are rarely applied to environmental risks. Instead, the facile mantra of "Zero risk Zero violations" echoes in corporate boardrooms across the land."

The Need for a New Approach

Many companies have realised the need for a proactive approach towards environmental issues instead of passive regulatory compliance. Take the case of Canadian paper company Alberta Pacific Forest Industries (AP). When AP faced opposition from farmers, aboriginal residents and other activists, following concerns about the environmental impact of a proposed pulp mill, it decided to take specific measures to mitigate the impact. The company designed its plant to keep pollution levels well below what the government specified. It also announced plans for forestation. AP also communicated clearly from time to time about the environmental impact of its operations. As a result of all these measures, the company successfully improved its relationship with the local community and eliminated costs which could have resulted from potential business disruption.

AP is however more an exception than the rule. Most companies show a high degree of adhocism and reactivity to environmental issues. Many companies also believe that command and control mechanisms, and formal procedures and rules will automatically take care of environmental risk. The right way to manage environmental risk is to integrate it within the company's overall risk management strategy. So companies must collect and store information about environmental issues systematically, and deal with environmental risks just like other business risks. Those responsible for managing environmental risk must be clear about the potential benefits of their investments and should be able to

¹ A V Vedpuriswar is Dean, Icfai School of Management.

² Mc Kinsey Quarterly, 1997 Number 3

justify the level and type of investment they have chosen.

Many companies fail to appreciate how investments in improving environmental performance will affect their competitive position. Environmental costs normally do not affect all competitors equally and tend to vary with location, size of the facility, technology used and age of the plant. Unfortunately, many companies do not appreciate these differences and in the process forgo opportunities to put competitors at a disadvantage. To take an example, vertically integrated and non vertically integrated players in the same industry may be affected in different ways by a new environmental regulation. Through suitable sourcing strategies or location decisions, a firm can put competitors to a severe disadvantage and even prompt them to quit the market.

Due to poor cost benefit analysis, most companies fail to get the best returns from their environmental investments. They undertake grandiose projects which do not yield commensurate benefits. Instead, they would do well to concentrate on liabilities which are small today but may escalate in future and where efficient solutions to the problem are available. Sometimes, companies close plants in a hurry without considering the implications. Regulators may intervene and demand expensive clean up operations, because there is no concern about further job losses. (They might not have done so if the plant were operational and there were fears of job losses. In some cases, companies have even reopened their plants taking note of such possibilities). Very often, managers spend a lot of money on environmental improvement but, do not involve nearby stakeholders before taking major decisions. Due to poor communication and a failure to take the local community along, they run into problems.

Managing Environmental Issues

In general, corporate environmental policies may serve one or more of the following objectives:

- Reduction of costs through measures such as recycling or energy conservation
- Improvement of the company's reputation
- Motivation of employees by providing a better environment

Exploding Myths about Environmental Management

Myth 1:	Environmental costs have rocketed but the worst is almost over.
Reality:	Given current regulation, law and public feeling, environmental costs are unlikely to come down.
Myth 2:	Costs are uncontrollable and non-discretionary
Reality:	There is much more control and discretion than is commonly perceived.
Myth 3:	Regulations fall uniformly on all competitors in an industry.
Reality:	Regulations fall unevenly, disadvantaging some and benefiting others.
Myth 4:	Just do the right thing
Reality:	What is right depends on the situation.

Source: Susan Colby, Tony Kingsley and Brad Whitehead, "The real green issue: Debunking the myths of environmental management." The McKinsey Quarterly, 1995 Number 2, pp. 132-143.

- Improvement of relationships with regulatory authorities in general and the government in particular
- Minimising the possibility of accidents
- Conformance to a code of ethics.

Forest Reinhardt³ suggests five different approaches to managing environmental issues.

- The first involves a strong commitment to environment friendly processes or products through heavy investments. The additional costs are recovered from customers through a clear differentiation and product positioning that allows the firm to charge a premium.
- In a slightly modified form of the first approach, the firm can influence environmental regulations, invest in environment protection and force other firms to make similar investments and still stay ahead of them in terms of costs incurred.
- In the third approach, the firm may be able to invest in environmental performance improvement, without any reduction in profits. This may happen

³ Reinhardt is a outstanding scholar in the field of environmental management. He teaches at Harvard Business School.

Environmental laws across the world

The UN Conference on Human Environment held in Stockholm in 1972 drew attention to the magnitude and scope of the environmental challenges the world faced. The conference came up with the idea of sustainable development, implying that development and environmental protection could co-exist. The UN Environment program aimed to act as a catalyst for research, technology and education in the area of environmental management. The Rio declaration on Environment and Development in 1992 was a result of the UN efforts.

In 1997, 180 countries signed the Kyoto protocol, in which 38 industrialised countries agreed to cut their emissions of greenhouse gases to levels that would be 5.2 percent below the 1990 levels, between 2008 and 2012. Cutting greenhouse emissions is the key to reducing global warming which can result in violent storms, expanding deserts, melting ice caps and rising sea levels. The cost of global warming has been estimated to be \$5 tn. Despite the Kyoto protocol, tensions continue about how environmental costs must be shared between developed and developing nations. The US recently withdrew from the pact arguing that developing countries also have an important role to play in reducing emissions.

In a meeting in Marrakech (Morocco) in November, 2001, members of the Kyoto protocol agreed on rules covering various issues – penalties for failure to meet targets, procedure for buying and selling the right to emit greenhouse gases and system of reporting emissions by each country during a year. Differences among countries still persist on whether the rules would be legally binding. A compromise wording at Marrakesh has postponed a decision on the exact legal nature of the agreement. The Kyoto protocol can come into legal force only if at least 55 countries representing 55 percent of 1990 carbon-dioxide emissions ratify it. The resistance of Russia and Japan to make the rules legally binding is a matter of concern. The EU hopes to ratify it by 2002.

In the US, the National Environmental Policy Act (NEPA) enacted in 1970 immediately followed by the creation of the Environmental Protection Agency (EPA) set the tone for the regulation of environmental issues. Federal agencies were asked to prepare formal environmental impact statements of all major Federal actions. The US adopted the “polluter pays” principle which required the polluting party found guilty of environmental norms to pay for any clean up. Important statutes in the US include the Clean Air Act of 1970, the Clean Water Act of 1987 and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980. CERCLA holds the current owner of the land liable for clean up of hazardous waste even where a previous occupant had dumped it. Standard US liability insurance policies exclude the clean-up costs associated with hazardous waste.

In Europe, Objective 17 of the EC policy statement confirmed the “polluter pays” principle, in 1977. The Maastricht Treaty of 1992 has included various provisions for environmental protection. The EU believes that precautionary measures should be taken even when full scientific evidence of the impact does not exist.

Environmental protection began to gain attention in Japan in the early 1970s. The country has subsequently enacted various laws to deal with air and water pollution and hazardous waste. Many of the pollution control measures in Japan are enforced not through law but by voluntary agreement. Experts feel that it is not the legal mechanisms, but the anxiety of many Japanese companies to avoid loss of face which acts as an effective safeguard.

Compiled by ICFAI Research Center from “Accord emerges on Kyoto Protocol”, The Economic Times, November 11, 2001, p4.

for example, if input consumption comes down because of effective recycling. Then, there is no need to impose higher prices on customers to recover the investments made.

- A fourth approach, which is much more sophisticated involves combining product differentiation, competition management and cost savings to change the basis for competition and redefine the market so that both the firm and the environment can benefit.
- The fifth approach looks at environmental issues from a risk management perspective, calling for a systematic method to deal with risks such as accidents and activist attacks.

The approach to dealing with environmental issues would vary from firm to firm. It would depend on the industry structure, the firm’s competitive positioning, its organizational capabilities and its perceptions about how regulatory and activist forces in the environment are evolving. We now examine each of the five approaches in greater detail.

Environmental Product Differentiation

Industrial customers are often prepared to pay a premium for products with improved environmental performance if their own costs can be reduced. Such customers may also be prepared to foot the premium

The Valdez oil spill

Exxon, one of the leading oil companies in the world, was involved in a major disaster in 1989, when one of its oil tankers, the *Exxon Valdez* ruptured its tanks in a collision off the coasts of Alaska and spilled 11 million gallons of oil in Prince William Sound of Alaska. The spill which polluted the coast and endangered vast numbers of wildlife received wide publicity and highlighted the vulnerability of the natural environment to industrial activities.

Alaska's remote wilderness along with its climate had made it an attractive tourist resort. The discovery of oil threatened the fragile ecosystem. Oil companies however argued that tight supervision and control would prevent accidents. Investigations after the spill revealed that the captain of Exxon Valdez was not even on the deck when the accident occurred. And the most basic management controls had failed. The systems installed on the ship and the land failed to stop or contain the spillage.

Immediately after the spill, Exxon chairman Larry Rawl made a public relations blunder by projecting the company as a victim and by reminding people about their dependency on oil. Subsequently, Exxon showed more responsibility and assured the regulatory authorities that it was willing and had the financial resources to support clean up operations.

Following the accident, oil companies, especially Exxon, saw their share prices drop and began to face hostility from customers, employees and potential recruits. Politicians and regulators insisted on more stringent pollution control requirements. The total cost for the industry was difficult to estimate, but the figures were in the range of \$5 – 15 bn for Exxon alone.

The chain of events prompted a group of investors to formulate the famous *Valdez Principles*, which had to be accepted by a public company before the group allowed its funds to be invested in the company's shares. (See Box item on Valdez principles). Exxon created more problems for itself when it hesitated to endorse the Valdez principles. Shareholders became outraged. However, it ultimately accepted a code of conduct, which included many of the terms laid down in the Valdez principles.

In 1994, a federal jury in Alaska ruled that it was Exxon's carelessness that had caused the grounding of the tanker and imposed a massive fine of \$5 bn.

A chastened Exxon began to actively promote Environment, Health and Safety disclosures. In 1997, Investor Responsibility Research Center identified Exxon as a leader in environmental performance reporting. The company claimed high safety standards, negligible spillage and more than 50 percent reduction in operating incidents since the start of the decade. In 1997, Exxon spilled less than a tablespoon of every million gallons of oil it shipped.

Compiled by ICFAI Research Center from Transworld University cases, Vol-7.

if they perceive that the superior product through better environmental performance can be a hedge against stringent regulations in the future. Ciba Specialty Chemicals' special dyes have helped consumers to cut expenditure on salt and water treatment and improve quality. This has enabled Ciba to charge more for its environment friendly dyes.

In the case of consumer goods, retail customers may be prepared to pay more if the environmental benefits can be bundled suitably. More generally, for such products to command a higher price in the market, the company's concern about the environment must be consistent with the other signals it is sending to customers. If the improved environmental performance is not well integrated with the overall product positioning or corporate strategy, it may fail to capture the value created. Starkist found that customers were not prepared to pay extra for its dolphin safe tunas⁴.

Managing Regulation

There are two broad approaches here: Self regulation and Managing government regulation.

Self regulation

Firms in an industry can come together and agree to incur additional costs for improving environmental performance. Self regulation can pre-empt more stringent government regulations. This helps companies to retain managerial discretion and flexibility in dealing with environmental problems. They may also be able to develop better standards than the government.

The main problem with self regulation is that the costs of adhering to the improved environmental standards may fall unequally across different companies in the industry. In many cases, smaller firms are

⁴ Tunas caught without killing dolphins. In many waters, tunas are found below dolphins floating on the sea.

The Valdez Principles

Protection of the Biosphere:

We will minimize and strive to eliminate the release of any pollutant that may cause environmental damage to the air, water or earth or its inhabitants. We will safeguard habitats in rivers, lakes, wetlands, coastal zones and oceans and will minimize contributing to the ozone layer, acid rain or smog.

Sustainable Use of Natural Resources:

We will make sustainable use of renewable natural resources such as water, soils and forests. We will conserve non-renewable natural resources through efficient use and careful planning. We will protect wildlife habitat, open spaces and wilderness, while preserving bio-diversity.

Reduction and Disposal of Waste:

We will minimize the creation of waste, especially hazardous waste, and wherever possible recycle materials. We will dispose of all waste through safe and responsible methods.

Wise Use of Energy:

We will make every effort to use environmentally safe and sustainable energy sources to meet our needs. We will invest in improved energy efficiency; and conservation in our operations. We will maximize the energy efficiency of products we produce or sell.

Risk Reduction:

We will minimize the environmental, health and safety risks to our employees and the communities in which we operate by employing safe technologies and operating procedures and by being constantly prepared for emergencies.

Marketing Safe Products and Services:

We will sell products or services that minimize adverse environmental impacts and that are safe as consumers commonly use them. We will inform customers of the environmental impacts of our products or services.

Damage Compensation:

We will take responsibility for any harm we cause to the environment by making every effort to restore the environment fully and to compensate those persons who are adversely affected.

Disclosure:

We will disclose to our employees and to the public incidents relating to our operations that cause environmental or pose health or safety hazards. We will disclose potential environmental, health or safety hazards posed by operations and we will not take any action against employees who report any condition that creates a danger to the environment or poses health or safety hazards.

Environmental Directors and Managers:

At least one member of the board of directors will be a person qualified to represent environmental interests. We will commit management resources to implement these principles, including the funding of an office of vice-president for environmental affairs or an equivalent executive position, reporting directly to the CEO to monitor and report upon our implementation efforts.

Assessment and Annual Audit:

We will conduct and make public an annual self-evaluation of our progress on implementing these principles and on complying with all applicable laws and regulations throughout our worldwide operations. We will work towards the timely creation of independent environmental audit procedures which will work towards the timely creation of independent environmental audit procedures which we will complete and make available to the public.

Source: "Corporate Responsibility", Tom Canton

disadvantaged while larger firms can leverage the benefits of improved reputation due to increased environmental performance. Thus, self regulation can change the basis for competition by favouring some firms at the expense of others.

Reinhardt mentions various conditions for the success of a self regulatory mechanism. The regulators must

be able to set measurable performance standards, have access to information to verify compliance and be in a position to enforce the rules. The program must serve the interests of a sufficiently large number of companies (and definitely all the important players) so that opponents cannot come together and block it. The program must have credible mechanisms for standard setting, monitoring and enforcement.

Managing government regulation

A firm may try to put pressure on its competitors by influencing the behavior of government regulators or other groups. Obviously, for such a strategy to be effective, the firm must have a unique competitive advantage under the new regime. As Reinhardt puts it: "There is no long-term benefit in a strategy of pure rent-seeking. Without some complementary investment in the market place or some pre-existing source of competitive advantage, the pay-off to an investment in regulatory change will be zero; the firm and its rivals will compete away the economic surplus they are trying to divert into their own pockets." A second condition for such a strategy to work is that, the firm should be able to convince customers, rivals and regulators that the new arrangement it is proposing is feasible. In general, the firm would be able to succeed in the geography where the regulatory regime is operating. In other areas, the firm will obviously find it difficult to convince the regulatory authorities. So, if a firm is competing with manufacturers in countries with lower regulatory standards, this strategy may not work.

Porter and Van der Linde⁵ emphasise that an adversarial relationship between the regulators and the industry locks companies into static thinking. It also leads to gross overestimates of the costs involved. Companies must realise that because of the learning curve effect, the cost of compliance is likely to decrease progressively over time. Hence they argue that continuous lobbying by an industry to dilute environment regulations may be opportunistic and counter productive.

Generating Cost Savings

Environmental standards can be used as an opportunity for introducing process innovations.

Environmental cost savings are often the result of lesser consumption of inputs. A good example is the hotel industry, where many companies have reduced solid waste generation and cut water and energy consumption. The Dutch flower industry is another good example. Due to intensive cultivation, pesticides and fertilizers were contaminating the soil and the foundation. Faced with stringent regulations, the industry worked hard to develop innovative solutions. It developed a closed loop system to reuse the water.

How better environmental performance improves efficiency of resource usage

Better environmental performance can improve the usage of resources and cut costs through:

- Reuse and recycling of inputs
- Improvements in process yields
- Better utilization of by-products
- Reduction in energy consumption
- Reduced raw material storage and handling costs
- Better product quality and consequently less rejection
- Lower packaging costs
- Reduced raw material costs

Source: Michael E Porter and Claas Van Der Linde, "Green and Competitive: Ending the Stalemate", Harvard Business Review, September-October 1995, P122-123.

Some green houses began to grow flowers in water and rock wool instead of soil. These measures reduced variations in growing conditions and improved the product quality. Specially designed platforms also lowered handling costs. Thus, environmental performance improved even as costs came down and global competitiveness increased.

Dow Chemical is another good example. Its California complex earlier scrubbed hydrochloric acid gas with caustic soda to produce various chemicals. The waste water was stored in evaporation ponds. Regulators insisted on closing these ponds by 1988. Dow responded by redesigning the production process and decreasing caustic and hydrochloric acid waste by 6000 tons per year and 80 tons per year respectively. It invested \$250,000 to generate annual savings exceeding \$2.4 mn.

In 1991, US regulators asked distillers of coal tar to effect substantial reduction in benzene emissions. The regulation motivated Aristech Chemical Corporation of Pittsburgh, Pennsylvania to develop a method for removing benzene from tar in the first processing step. This did away with the use of expensive gas blankets. The new pollution control measures enabled Aristech to save \$3.3 mn.

In general, cost savings can be realised if three conditions hold good. In the first place, opportunities

⁵ Harvard Business Review, September/October, 1995

Environmental Management in India

Environmental practices in India have improved significantly in recent times. Used to a fairly lax regulatory environment for a long period of time, many Indian companies had not taken environmental management seriously in the past. Now, regulations have become more stringent. Moreover, many companies are looking at environmental management as a means to improve their reputation and cut costs. A recent survey of 47 companies conducted by Business Today and Tata Energy Research Institute revealed that 75 percent of them had an environmental policy. Many companies have quantifiable targets in areas such as emissions and some really stand out in their efforts to upgrade environmental performance.

Bayer India believes that successful environmental management programs pay for themselves. The company has invested in incinerators and leased out 30 percent of its capacity to other chemical firms. The fees charged have enabled it to recover most of the costs. At Clariant India, waste reduction has helped to cut waste disposal costs. Better environmental practices have also reduced water consumption. At Philips India's Pimpri unit, tubelights were earlier flushed with 70mg of mercury each to ensure that 15mg stayed in the tube. This not only added to environmental hazards but also increased costs. Philips switched over to argon flushing, reducing both pollution and costs in the process. At Tata Steel, improved environmental practices have strengthened the bottomline through lower consumption of raw materials and better utilization of waste.

Yet, environmental management in India has still a long way to go. Children in 15 villages adjoining the Uranium Corporation of India Ltd (UCIL) Mines in Jadugoda have been affected while workers are suffering from serious ailments. A 1998 study by the Jharkand Organization Against Radiation (JOAR) revealed that many women, in the region suffered from miscarriages and stillbirths. 16 percent of the children born to them died in their infancy. Lack of safeguards at the UCIL mines in Jharkand has exposed 30,000 people in 30 villages to radiation risks. Nuclear waste has been pumped into waste dumps called tailing ponds. Wind blows the harmful dust around in summer while in the rainy season, the river water gets contaminated. In 1994, there were 17 deaths and by 2001, it had gone up to 31. Many people have been affected by cancer.

Strangely enough, the UCIL management's attitude has been nonchalant to say the least. Chairman and Managing Director, Ramendra Gupta was quoted in *The Week*⁶, "The Pan Parags (Chewing tobacco) are causing bigger health hazards than uranium mining. You (Journalists) should run after the manufacturers of these than chasing us." Gupta has even cited an Atomic Energy Commission report as stating that radiation levels within five kilometres of Jadugoda are normal. He has also argued that malnutrition and alcoholism, rather than radio activity are behind the illnesses in Jadugoda.

The question of safety of India's nuclear facilities has once again become a hot topic of debate. Many of the facilities are located in densely populated areas. Some do not have adequate cooling systems. According to a *Times of India* editorial⁷, "Alarmist as this may sound, a Chernobyl is waiting to happen here... Our nuclear pundits will insist a Chernobyl cannot happen here... Such smugness is not seen even in the developed world which is much more conversant with nuclear technology."

Many Indian companies look at ISO 14001 certification as an end in itself. Most have not integrated environmental management into their corporate strategy. And in some instances, green initiatives have been launched without a clear understanding of the potential benefits. In the worst cases, companies flout pollution laws merrily and pay bribes to government inspectors when they visit the premises. Quite clearly, Indian companies still have a long way to go in the area of environmental management.

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to save costs must exist. The firm must be able to modify its processes to tap the savings. Most importantly, managers must have clear incentives to make the changes necessary. In some cases, there can be several intangible costs or unquantifiable cost savings. By attracting and retaining talented managers, better environmental performance may reduce recruitment and training costs. A systematic search for internal cost savings may also result in organizational learning and improved process

capabilities. All these strategic benefits must be considered while taking a decision.

Redefining Markets

Companies can also try a combination of the various approaches discussed so far. They can redefine the property rights, through buy back schemes for example, and combine it with advances in technology to create a strong competitive position. They can use research to develop new ways of offering

⁶ September 2, 2001

⁷ October 5, 2001

services to customers and attempt to shape the future of the industry's environmental practices.

Environmental Risk Management

Reinhardt, has identified four different elements of environment risk.

- probability of occurrence of an adverse event such as an accident
- probability distribution of the total costs if the event occurs
- allocation of the responsibility if an accident occurs
- certainty of the assessment.

In other words, four different tasks have to be performed by management while managing environmental risks. They must minimise the probability of occurrence of the adverse event. They must cut losses when an accident occurs. They should be able to shift responsibility to other parties to the extent possible, when the event occurs. They must obtain more information to make the risk assessment methodology as robust as possible. Managers have to use the right mix of risk reduction, risk shifting and information acquisition to put in place an appropriate environmental strategy.

For many organizations, managing environmental issues means avoiding the costs associated with accidents, catastrophes and other environmental mishaps. The simplest way of managing environmental risk is to buy an insurance policy. This shifts risk to the insurance company. The approach makes sense if the company is confident that the premium being paid is small compared to the huge risks involved. A second approach relies on maintenance of disaster management cells which can respond quickly when an accident occurs. A third approach involves clear guidelines, including do's and don'ts for the operating units in the form of various documents and manuals. A fourth mechanism is to link promotions of managers with their contribution to risk management. Behavioral issues need to be carefully examined so that environmental risk is managed systematically. For example, reward systems normally favor managers who reduce costs or increase profits. Consequently, there may be a

tendency to underinvest in environmental performance improvement measures. Inbuilt mechanisms are necessary to check such undesirable tendencies.

Concluding Notes

Environmental problems should be analysed as business problems. A rigorous analysis is necessary to understand which investments generate value for shareholders. Neither is it desirable to do just the bare minimum to stay on the right side of the law nor is it correct to pour huge amounts of money into environmental projects, in the name of discharging social responsibility. As Reinhardt puts it⁸: "Companies aren't in business to solve the world's problems nor should they be. After all, they have shareholders who want to see a return on their investments. That's why managers need to bring the environment back into the fold of business problems and determine when it really pays to be green... The truth is, environmental problems do not automatically create opportunities to make money. At the same time, the opposite stance – that it never pays for a company to invest in improving its environmental performance – is also incorrect."

Managers should also look at better environmental performance as an opportunity rather than a threat. As Porter and Van der Linde⁹ put it: "Instead of clinging to a perspective focussed on regulatory compliance, companies need to ask such questions as, What are we wasting? And how can we enhance customer value?"

Many companies allow environmental issues to be handled by lawyers and consultants who tend to focus on compliance rather than innovation. To correct this situation, environmental strategies must become the direct concern of general management and environmental impact should be incorporated in the overall process of improving productivity and competitiveness. Managers should go beyond currently regulated areas and also understand the opportunity cost of underutilized resources. ■

The author is consulting editor, Global CEO and Dean, Icfai School of Management, an ICFAI affiliate.

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⁸ Harvard Business Review, July-August 1999

⁹ Harvard Business Review, September-October, 1995