


Principles of Ecology and Management:

International Challenges for Future Practitioners

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 Published by Goodfellow Publishers Limited, Woodeaton, Oxford, OX3 9TJ
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Design and setting by P.K. McBride

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Pollution

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Learning objectives

After reading this chapter, you will be able to:

- Identify a range of pollution sources generated by business activities
- Detect the effects of pollution on companies' physical environment
- Set pollution within a sectoral context.

■ Introduction

? Should a company's customers be held responsible for its pollution?

It is difficult to say who has greater responsibility for the damage being done to the ecosystems that sustain life on Earth: the companies manufacturing the goods that consumers use; or the households purchasing such items. At a certain level, however, this is a moot question – to the extent that companies pollute and suffer from pollution, they clearly bear at least some responsibility for the deterioration of the natural environment.

Throughput: ■
Holistic overview of elements in all of their different stages as they transit through a transformation process.

Toxicity: ■
Extent to which a substance causes harm to different living organisms.

Ecological myopia: ■
Unwillingness or inability to envision the long-term environmental consequences of one's own behaviour.

? How difficult is it to attribute responsibility for line pollution?

Chapter 1 detailed the basic principles of Newtonian thermodynamics, to wit, the idea that matter is never destroyed, and that all action provokes a reaction. The former concept is the basis of the **throughput** logic that states how all inputs found at the beginning of a physical process are also present at its end, albeit in a changed form. Thus, if a company begins a transformation activity with inputs that are damaging the environment, these will still be present afterwards and require safe disposal. The latter concept is key to **toxicity** studies, based on the self-evident scientific principle that foreign substances cannot be repeatedly injected into a biosphere without ultimately provoking disturbance. The implication here is that companies' treatment of their natural environment as a waste bin is at best an example of **ecological myopia** and at worst a case of criminal neglect. As such, the subject of pollution raises questions pertaining not only to ecological sciences but also to managerial value systems (see Chapter 5). Since the dawn of time, societies have looked the other way while polluters have polluted. After millennia of environmental deterioration, such apathy is no longer feasible.

■ Pollution sources

Analyses of corporate pollution often start by comparing point, line and surface sources of pollution (Sen 2009). The former category refers to emissions, effluents and other outflows with a single identifiable origin that can be either movable or stationary. This differs from non-point source pollution, such as when water tables are polluted by the runoff of nitrogen-based fertilisers used throughout the whole of a farming district – or in the case of an urban runoff, when contaminated discharges from a variety of industrial or household sources find their way into the sewers. As for line pollution, this refers to all waste coming from a particular sector, one example of which is smog from

automobile traffic. Whereas emissions from one vehicle might be classified as point source pollution, the overall problem is so enormous that solutions need to be sought at a broader macro level encompassing all road vehicles. Analysts will therefore focus on traffic in general as a line source of pollution, with some referring to an 'area source' when multiple pollutants are involved, or to a 'volume source' when emissions' geometric aspects also enter the equation. Further distinctions can be made between pollutants' area of impact (upper atmosphere, at the Earth's surface, deep underground or some combination thereof) and whether they occur constantly or intermittently. Lastly, 'surface source' pollution is a commonly used term in water pollution studies and refers to water running off urban or rural surfaces and carrying contaminants such as organic or inorganic chemical substances, as well as hazardous bacterial or viral **pathogens**.

The reason why it is so important to identify pollution categories is because each requires a different set of responses. Depending on whether a particular kind of pollution has a single origin or not (and whether it affects one or many actors), there will be a marked variation in the level of political outrage that is caused and in companies' legal liability. A mainstream activity with a small negative impact on one small actor will receive a very different response than a single source pollution event that devastates an entire community – one disastrous example being an incident from 1986 at Bhopal in India when a Union Carbide chemical plant exploded, causing the death of thousands. Pollution is a very general word encompassing a variety of situations.

■ **Pathogen:** Biological agent causing disease in living organisms.

■ Toxicity studies

Scientists have several ways of apprehending the pollution caused by companies and its effects. Usually, the main focus will involve examining the damage caused when pollutants interact with their surroundings, i.e. the level of toxicity. In turn, this will depend on a host of factors, first and foremost being the possibility of 'dilution', or the principle that the lower the concentration of a pollutant in proportion to the agents (water, solvents) capable of dissipating its effects, the greater the chance of containing any negative side effects. Thus, an element that is non-toxic in small doses will often become toxic in larger quantities. Of course, the notion of concentration must be understood not only in volume and quantity terms but even more importantly in terms of the pollutant's capacity for causing harm, and to what extent it might be broken down into something less noxious. Clearly, radio-

Chapter extract

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