

Topic 13: Waste and Toxic Substances

“Setting-the-scene’ information provides a brief introduction of waste and trends in waste generation and hazardous waste management. This topic will provide more insights on economic approach to the incidence of hazardous waste siting decisions.

“The siting of hazardous waste facilities seems to have resulted in a distribution of risks that **disproportionately burdens low-income populations, and minority communities**. This outcome suggests that *current siting policies are **neither efficient nor fair.***”

The economics of hazardous waste disposal site location:

Incentives for the owners of the proposed facility vs. the recipient community.

- Owners → maximize profits by considering a site that they can process the wastes at a low cost. The sites would be attractive if:
 - Locate near the sources of waste → less transportation costs
 - Have lower land costs as facilities are normally land-intensive
 - Pose a few liability risks to limit future payouts
- Recipient community → to ensure that it reaps benefits that outweigh costs.
 - The site should be safe for both employees and the inhabitants of the surrounding community. They will require adequate compensation (such as employment, enhanced tax revenues, new public services) for assuming risks at the site.
 - So, low-income communities are attractive as disposal sites as they typically require less compensation to accept the risk
 - Once hazardous waste facilities are located in a community, it is likely that the community will even have low income due to negative impact on surrounding property values and migrations.
 - While higher income families have higher willingness to pay for risk-avoidance, they may depart to the site with less risky environment. While, low-income families will usually choose low land prices (or rents). So, even if the community were not low income at the time of siting, it is likely to become so over time (as high-income depart, reduced property price attracts more low-income to the site).

Therefore, an efficient siting process might target a disproportionate share of these facilities in low-income communities.

Efficient location requires **full information** and **adequate enforcement of agreements**

- **Without full information**, recipient communities can fail to fully understand risk and so are likely to undervalue it (market failures). As the minority communities have typically less adequate information than those white communities, so **race** could become a predictor than income for efficient site location.
- Lack of power to enforce the community will (e.g., underrepresentation of leaders) may lead to inefficient implementation of efficient agreements

Therefore, the current siting process may be both discriminatory and inefficient. Until recipient communities can be guaranteed both full information and the capacity to enforce the community's will, the hazardous waste siting process will remain seriously flawed. The responsibility for this policy failure seems to lie mainly with the failure to ensure informed consent of residents in recipient communities and very uneven enforcement of existing legal protections.

Policy responses:

- **Environmental justice and hazardous waste sites:** With the problems related to hazardous waste sites, the following entities were established
 - **Office of Environmental Equity** was established in 1992 (under EPA) to deal with environmental impacts affecting people of color (race) and low-income communities. Initial efforts focused on gathering more information about the problem and strengthening enforcement inspections and compliance monitoring in impacted communities.
 - **Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations** was established in 1994 to ensure minority groups and low-income populations are not subjected to an unequal or disproportionately high level of environmental risks.

Problems: the Order has not been fully implemented/not consistently integrated environmental justice into its day-to-day operations. Also, there has been no criteria developed for determining the disproportionately impacted.

- **EJSCREEN, a new EPA's screen tool**, was later established for internal use to provide nationally consistent data and methods for screening areas of potential environmental justice (EJ) concerns, employing 12 environmental indicators plus race and income
- **Public participation** has been cited as an important factor in the successful (no environmental justice concerns arisen in the host communities) siting of hazardous waste facilities in Canada. The siting process requires multiple stages at which the

community can exercise veto power over the project (i.e., the *power* to unilaterally stop the project). Interestingly, the siting location has resulted in the town with an average household income significantly higher than the average in the province and one of the lowest levels of employment. This is due to the potential jobs at the facilities that increase the likelihood of the communities to accept the project.

- **Compensation as a policy instrument:** Pay compensation or host fees to communities accepting hazardous waste facilities. This would ensure benefits, not merely the costs, accrue to the local community and also internalize the cost of the environmental risks. However, the compensation could also be viewed as a morally unacceptable bribe and, hence, should be rejected as evidenced in the case of siting a nuclear-waste repository in Switzerland.
- **Creating incentives through common law:** When a victim seeks recourse through the court system, a number of legal grounds can be sued to pursue a claim. Two common legal grounds include:
 - **Negligence** – suggests that the defendant (those allegedly responsible for the contamination) owes a duty to the plaintiff (the affected party) to exercise with care. On this ground, the defendant is forced to compensate the victim for damages caused if the defendant is found guilty of negligence (marginal loss by the contamination > marginal cost of preventing the contamination)
 - **Strict liability** – Under this principle, the plaintiff does not have to prove negligence. As long as the defendant's activity causes damage, the defendant is declared liable even if the activity is completely legal and complies with all relevant laws. The disposal of toxic substances is considered such an activity. This principle transfers liability for damages to the source whether or not the source has exercised much care, so the responsible party has an incentive to begin immediately both the cleanup and the process of compensating victims. Strict liability can also be compatible with efficiency because it sets a precedent that makes those might be responsible for damages recognize that the damages will be internalized.
- **Role of courts:** Unlike air and water pollution, the courts may play a particularly important role for the toxic substance problems. **Liability law** not only creates a market pressure for more and better information on potential damages associated with chemical substances, but also it provides some incentives to manufacturers of substances, the generators of waste, the transporters of waste, and those who dispose of it to exercise precaution. Judicial remedies also allow the level of precaution to vary with the occupational circumstances and provide a means of compensating victims.

- **Statutory Law** such as Toxic Substances Control Act, Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water and Toxic Enforcement Act (to protect drinking water sources from toxic chemicals), etc.
- **The efficient role of government** can range from ensuring the provision of sufficient information (so that participants in the market can make informed choices) to setting exposure limits on hazardous substances. Unfortunately, the scientific basis for decision making is weak. And, only limited information on the effects of these substances is available, and the cost of acquiring complete information is prohibitive. Therefore, priorities must be established, and tests developed to screen substances so that efforts can be concentrated on those substances that seem most dangerous.

Reference: [TL] – Tietenberg, T. and Lewis, L. Environmental Natural Resource Economics, 2015 (10th edition), Pearson, Chapter 19.