

The background image shows a vast landscape covered in a thick layer of discarded plastic waste, including bottles, containers, and other debris. In the distance, a large, dark mound of trash rises against a sky with soft, golden light from a setting or rising sun. The overall scene conveys the scale of plastic pollution.

Toxic substance pollution controls

Class EE375

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

Questions to be considered:

What are appropriate ways to dispose of toxic substances?

How can the government ensure that all waste is appropriately disposed of in a way that does not disproportionately disadvantage some socioeconomic groups?

Should victims be compensated for damages caused by toxic substances under the control of someone else?

What are the appropriate roles for the laws and regulations in creating the proper set of incentives

Are these pollution control standards efficient?

Govern the types and amounts
of substances injected into the air

Emission
Standards

Pretreatment
standards

control the flow of toxics
into wastewater treatment
plants

น้ำฝน
Effluent
standards

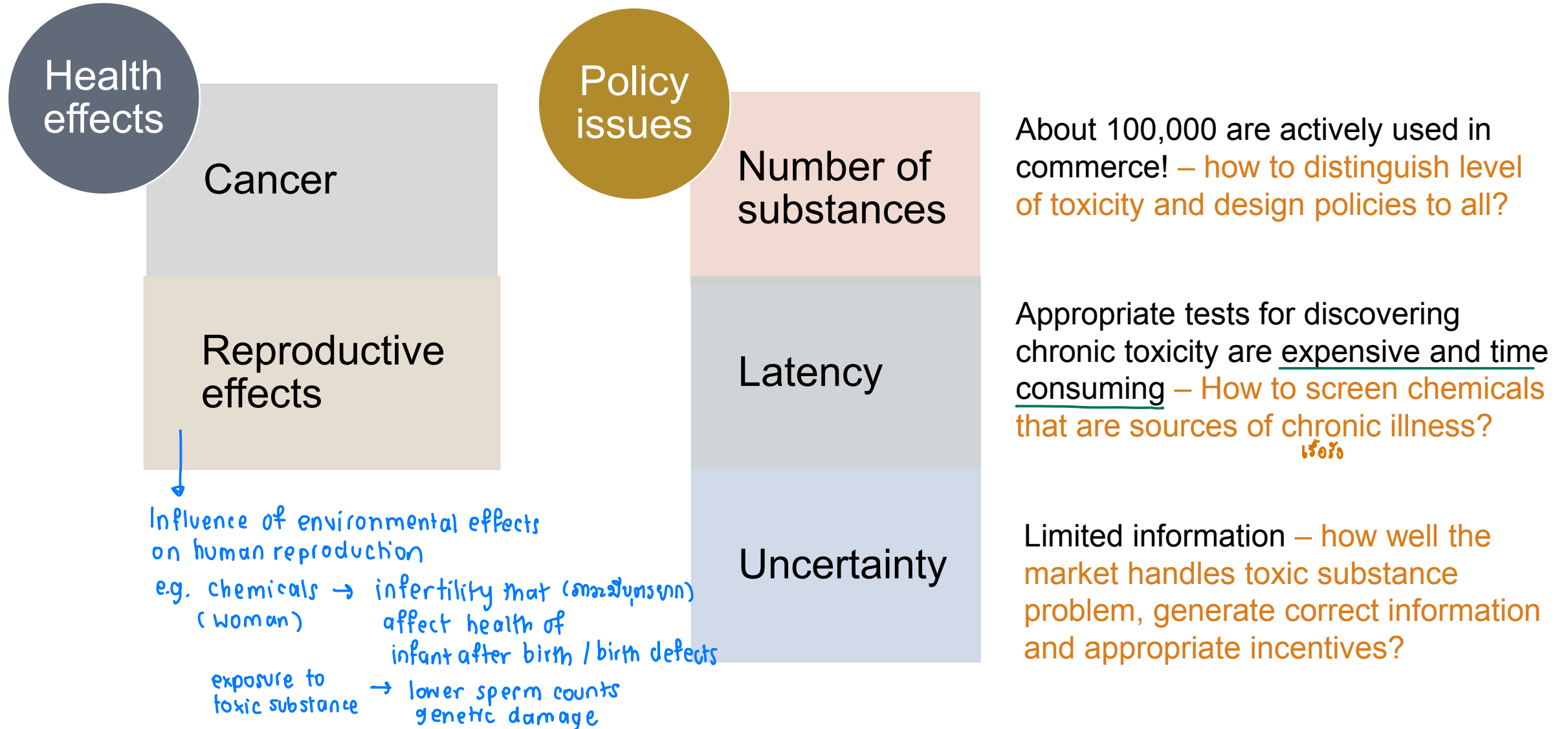
Regulate what can be discharged
directly into water resource

Maximum
concentration
levels

for substances
in drinking water

- Detect violations of standards for drinking water
 - ↳ water is already contaminated
- Identify problems exist → No prevention measures.
- Standards for air & water emissions
 - do little to prevent contamination by non-point sources.

Nature of toxic substance pollution



Occupational hazards: Market allocations

Employers

- Max profits precludes spending money on safety

① Marginal cost of providing precaution

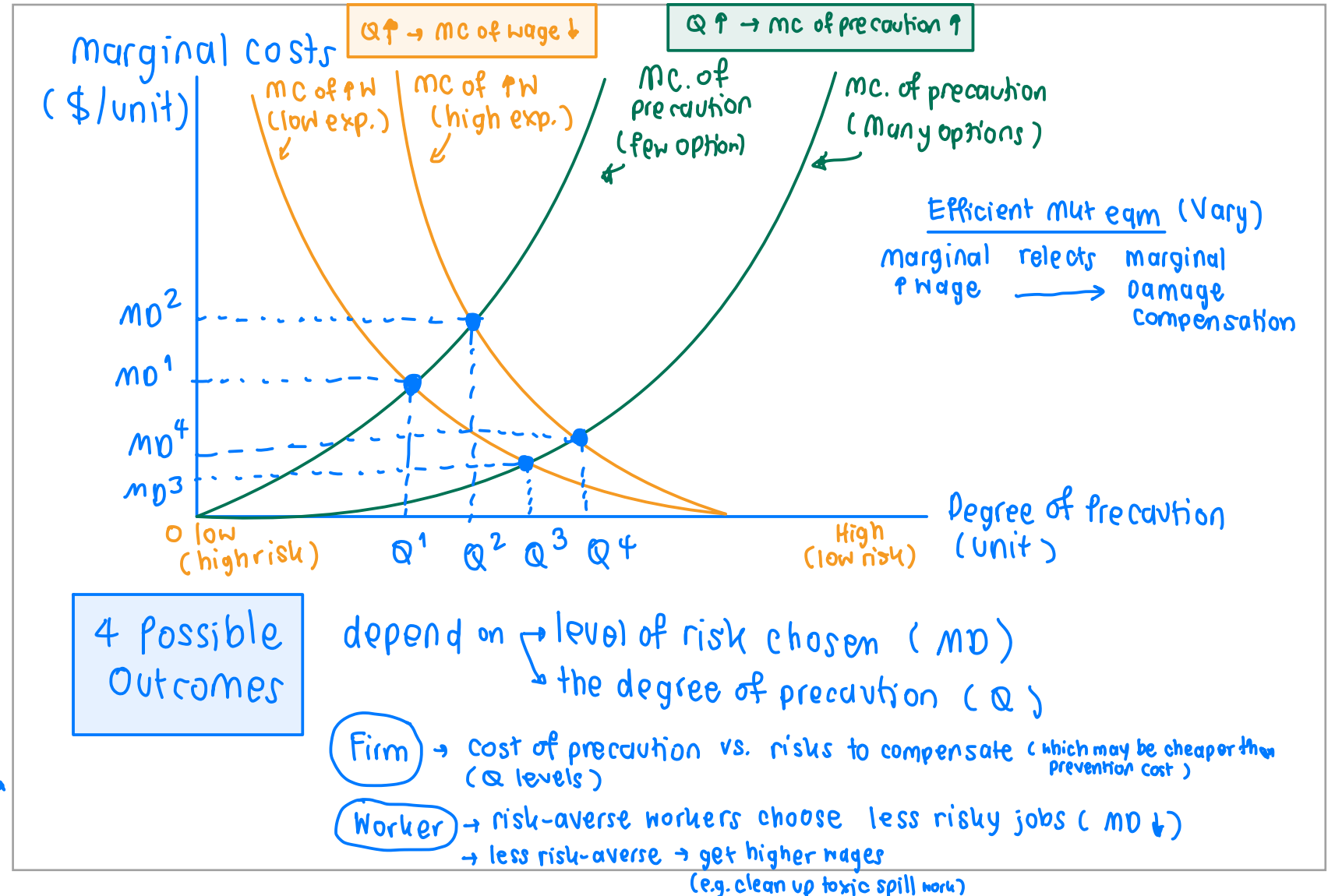
→ steeply cost curve for a few expensive precautionary options

Employees

- Accept riskier occupations with higher wages

② Marginal cost of ↑ wages

→ real cost of hazard to employer.
→ high exposure higher wage ↑



Occupational hazards: Challenges for market solutions



E.g., ban pregnant -> unfair discrimination against women

E.g., Workers know little about seriousness of the danger from toxic substances -> little precaution and not sufficient compensation

The market will not provide an efficient level of information on occupational risks

Occupational hazards:

Potential roles of government and laws

Roles

Setting boundaries
on ethical
responses

Research on the
nature of hazards

Enforce a safety
threshold

Level of safety in workplace

Laws

Require businesses to disclose any potential health hazards associated with toxic substances used

Label toxic substance
containers ✓

Inventory all toxic
substances used in the
workplace

Adequate training on
the handling of these
substances to affected
employees

Third Parties as the victims: No contractual relationship to the source

Oil spills, contaminated groundwater caused by

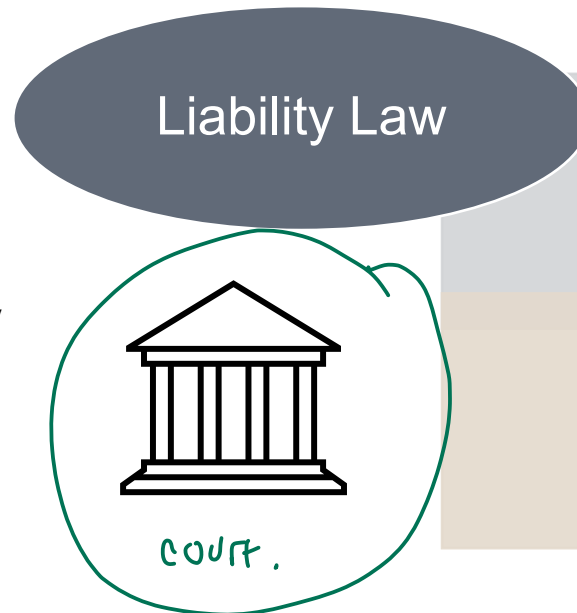
- a neighboring wastewater treatment facility or
- a neighbor's improper application of a pesticide



Not have any direct market pressure to the source, so **need government intervention!!!**

Need to balance:

- Gains in efficiency when choosing the appropriate remedy for any situation
- Costly process due to administrative costs to the court



Force potential sources of toxic discharges to choose efficient levels of precaution

Provide compensation to the victims for the damages caused

The economics of hazardous waste disposal site locations

Facility owners

- Max profits by choosing a site that can process wastes at a low cost
- The site should locate near the sources -> less transportation costs
- Low land costs (land-intensive facilities)
- Little liability risks to limit future payouts

Recipient community

- Ensure that benefits outweighs costs
- The site should be safe for both employees and the inhabitants of the surrounding communities
- If not safe – need adequate compensation such as employment, new public services, etc. for accepting the risks

“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.***”

In low-income
minority
communities

- low property values
(due to negative impacts of waste facilities)
- migrations
higher-income families depart
→ property price ↓

Why?

- require less compensation to accept risks.
 - ↳ Low-income families will choose to stay in low land prices
(↓ property price attracts more low-income to the site)

The economics of hazardous waste disposal site locations

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. 

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.

The economics of hazardous waste disposal site locations: Policy Responses (1)

Environmental justice and hazardous waste sites – established the following entities, tools and participation:

- **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
- **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 economics of hazardous waste disposal site locations: Policy Responses (2)

Compensation as a policy instrument:

- Pay compensation or host fees to communities accepting hazardous waste facilities. This would ensure benefits accrue to the local community and also internalize the cost of the environmental risks.

The efficient role of government

- Range from ensuring **the provision of sufficient information** to **setting exposure limits** on hazardous substances. Unfortunately, the scientific basis for decision making is weak, limited available information on the effects of these substances and prohibitive costs of acquiring complete information. Therefore, priorities must be established, and tests developed to screen substances so that efforts can be concentrated on those substances that seem most dangerous.

The economics of hazardous waste disposal site locations:

Policy Responses (3)

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 those responsible for the contamination owes a duty to the affected party to exercise with care. So, the defendant is forced to compensate the victim for damages caused due to the guilty of negligence
- **Strict liability** – Under this principle, if the defendant's disposal of toxic substance causes damage, the defendant is declared liable even if this activity is completely legal and complies with all relevant laws. This principal transfers liability for damages to the source, 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.

The economics of hazardous waste disposal site locations: Policy Responses (4)

Role of courts:

- Unlike air and water pollution, the courts may play a particularly important role for the toxic substance problems. **Liability law** 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.