

Assessing Costs of Waste and Pollution-- Environmental Economics

by Sophia Tutorial



WHAT'S COVERED

This tutorial will discuss assessing costs of waste and pollution, focusing on environmental economics. We will explore why it is difficult to estimate the value of environmental quality, and discuss the methods currently being used, including their merits and potential issues.

Our discussion breaks down as follows:

1. Measuring the Value of Environmental Goods
2. Methods of Estimating the Value of Environmental Regulation
 - a. Cost-Benefit Analysis
 - b. Healthcare Costs
 - c. Contingent Valuation
 - d. Hedonic Pricing

1. Measuring the Value of Environmental Goods

Remember, economies have developed in order to answer three main questions for every society:

- What gets produced?
- How does it get produced?
- Who receives the produced goods and services?

For an economy to efficiently produce goods and services, we need to know the costs and benefits of them.

Some goods, such as environmental goods, pose a challenge because it is very difficult to estimate their value.

How do we actually go about finding the value that society places on the environment? Should we survey people?



THINK ABOUT IT

Imagine if someone called you and asked, "How much is the environment worth to you?" How would you answer that question? You likely value the environment, but how do you quantify it?

The problem is if people know that their responses will lead to public policy, then people who want to see government regulation of the environment will tend to overestimate this value.

On the other hand, people who want less regulation will underestimate the value that they place on environmental goods.

2. Methods of Estimating the Value of Environmental Regulation

These are the four methods that environmental economists use in order to estimate the value of environmental regulation:

- Cost-Benefit Analysis
- Healthcare Costs
- Contingent Valuation
- Hedonic Pricing

2a. Cost-Benefit Analysis

We use cost-benefit analysis in all different branches of economics.

On the cost side, we can determine the costs of clean-up. We can figure out a dollar amount to clean waste sites or pollution in a certain area.

However, what are the costs of the regulation itself? Will they lead to higher prices of the goods or higher production costs faced by producers?

These costs may not be completely understood and may not even consider the impacts on the overall ecosystem.

So, while we determine some aspects of the cost side, arriving at the cost of the regulation is a bit more difficult.

On the benefit side, again, these are based on peoples' opinions, so how do we measure these benefits objectively without bias? Bias is very possible, which will pose an issue.

2b. Healthcare Costs

Next, let's discuss healthcare costs. We know that pollution in the environment can certainly lead to negative health outcomes.

It can have an impact on how people are living and the kind of health that they have, so we can estimate these healthcare costs as a link to the cost of pollution.

Now, this also has its issues. With pollution, it can take years and years to impact peoples' health. Some of it

can be short-term and we can measure it right away, but we don't always know how long it is going to take to see these impacts on peoples' health.

In addition, everyone is affected differently by pollution. Some people may have no health impact because of it, while others might have a lot.

Because of the diversity, in terms of how long it can take and how people are affected differently, these issues can lead to a much lower estimated cost in terms of impact on healthcare.

2c. Contingent Valuation

"Contingent valuation" is a survey method to extract individuals' preferences regarding a non-market resource.



Remember, non-market resources are things that aren't bought and sold in the marketplace. This is why environmental goods are a non-market resource--because we are focused on valuing the environment.

We can estimate the value of environmental goods, like national parks, using this method.

What economists would do is have people surveyed again and they would ask them to state their preferences and willingness to pay to visit a national park.

In this case, then, it would be more specific than simply, "How much do you value the environment?" Here, it would be, "What would you be willing to pay to visit a national park," for example, and people would provide dollar amounts that they would be willing to pay.

If you take their responses and multiply by the number of citizens, we can arrive at a value of the environmental good, like a national park.

Of course, this has its issues because, again, it relies on surveys, so it is very much subject to bias. Also, it may underestimate or overestimate based on people's responses.

🔗 **EXAMPLE** For example, someone who absolutely loves nature may already have chosen to live near a national park and would therefore not have to pay to visit it.

There are many other examples like this that can cause an underestimation or overestimation on environmental goods.



Contingent Valuation

Survey method to extract individuals' preferences regarding a non-market resource

2d. Hedonic Pricing

The final method we will discuss is **hedonic pricing**, which is a system created to examine internal and external factors affecting the price of the good.

Any time a good has a lot of different factors affecting its price, sometimes we can break it down into everything that goes into that price using this method.

IN CONTEXT

Hedonic pricing is often used in the real estate market to study property values because so many factors contribute to the value of a home.

One factor that affects property value is waste and pollution in the area. Areas with less waste and pollution tend to have higher property values, for obvious reasons.

We can measure the change in property value when there is a difference in waste or pollution.

For instance, if we look at two identical houses—one in an area with little pollution and one in an area with a lot of pollution—then we should be able to look at the change in property value and calculate that the difference would represent the cost of the pollution.

Again, there are going to be some issues with this, because this assumes that two houses that seem identical, except for environmental quality, are the same in every other way.



HINT

This assumes *ceteris paribus*, which you may recall means "everything else held constant."

Because what creates a property value for a home is so complex, there may actually be other differences between the houses causing the property value to differ.

This, in turn, would bias the estimate for environmental quality.



TERM TO KNOW

Hedonic Pricing

A system created to examine internal and external factors affecting the price of a good



SUMMARY

Today we discussed the difficulty that arises in **measuring the value of environmental goods** or quality. We learned about the **methods of estimating the value of environmental regulation**, which include **cost-benefit analysis**, examining **healthcare costs**, **contingent valuation**, and **hedonic pricing**. It is important to keep in mind that while all of them certainly have their merits, they also have potential issues.

Source: Adapted from Sophia instructor Kate Eskra.



TERMS TO KNOW

Contingent Valuation

Survey method to extract individuals' preferences regarding a non-market resource.

Hedonic Pricing

A system created to examine internal and external factors affecting the price of a good.