

EXTERNALITIES: WHO BEARS ENVIRONMENTAL DAMAGE COSTS? WHO IMPOSES THESE COSTS? WHAT IS A BALANCE?

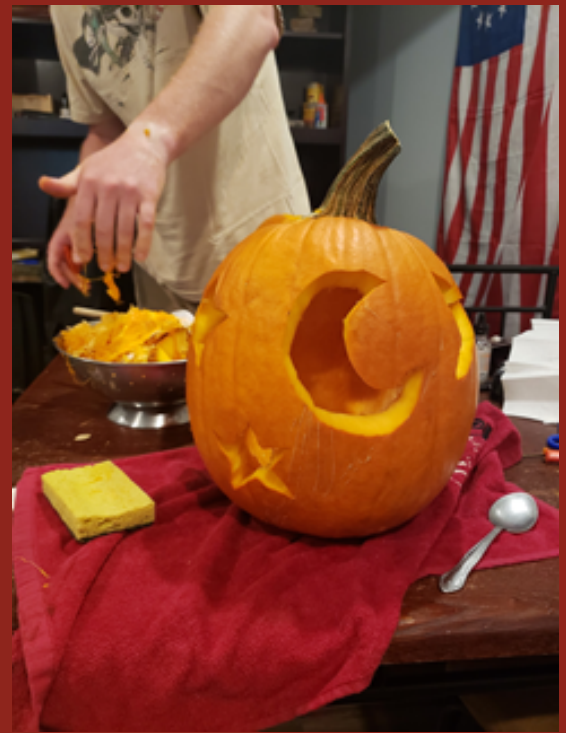
By Julia Ward

When someone talks about natural resources and our shared environment, what do you think of? Grassy prairies? Majestic mountains? Great sprawling forests? Powerful breaking surf on an ocean shoreline? Polar bears on a shrinking patch of drifting ice? Struggling sea birds covered in crude oil? Serene lakes glowing with sunset lighting? Invasive mussels choking water intake pipes? With so many iconic images from films and posters, it may not occur to many of us to associate nature with essential everyday actions such as drinking a glass of water, taking a deep breath of air, eating our favorite foods. These basic human needs would not be met without a healthy, well-functioning ecosystem.

Resource economists study the complex interlinkages between ecosystem goods and services, markets, incentives that influence human decisions, and society. These interlinkages include a wide variety of environmental inputs and how these enter the broader mix of economic activities at all levels, including individual consumers, producers, firms, policy makers, pollution control regulators, and more. Resource economists study how decisions made by consumers and producers, coordinated through markets and policies manage allocation, use and conservation of natural resources and environmental services. We examine how these resources are used efficiently, and the economic consequences of their overuse. Consider the example of a farm

that uses water from a nearby river to irrigate crops. As fields are watered, some fertilizer runs into the river. The river carries excess nitrogen and phosphorus from the fertilizer through fresh-water swimming areas to the ocean where it accumulates to trigger an algae bloom. The algae reduces oxygen in the water, triggering bacterial growth, affecting commercial fisheries and the local tourism industry.

Economists call costs that are transferred from the actions of some to have consequences on others “externalities.” The total effect from the actions of many several dozens of farmers, as well as homeowners striving for green lawns, produce negative consequences to people using ocean and shoreline resources. The impacts of each individual farmer are likely very small, and very possibly not realized by the farmer. These costs do not figure into decision-making, the costs of fertilizer purchased and used do not include the cost of each pound that other people will eventually bear. The economist would point out here, that if one could measure the incremental cost to others downstream of each additional pound of fertilizer used, this component could be added as a fee to the market price of fertilizer and would thereby account for the full cost of fertilizer used – leading to less fertilizer used by each farmer, as they seek to adjust their input costs and returns. The adjustment to the market price of fertilizer would alter the farmer’s judgement about how much fertilizer to use – or not use – thus rebalancing the amounts of nitrogen and phosphorus that can increase the severity of algae blooms.



MY BOYFRIEND AND I ARE HERE CARVING PUMPKINS IN THE MIDDLE OF WASHINGTON DC, BREATHING CLEAN AIR, WEARING JEANS AND T-SHIRTS MADE FROM CULTIVATED COTTON, AND CARVING A GOURD THAT WAS GROWN ON A FARM AND TRANSPORTED TO OUR GROCERY STORE. OUR METAL SPOONS ARE MADE WITH IRON MINED FROM ORE, AND OUR PLASTIC CARVING UTENSILS ARE MADE FROM FOSSIL FUELS PULLED FROM OIL RESERVES.

“Well,” you might say, “nice example, but most of us don’t live near the ocean and don’t eat fish. This whole thing sounds like it will end up in more taxes on farms and higher prices for the food – costing us all more. Most people do not want to think about increased prices or pollution taxes because this all is another drain on our income and well-being.”

“Ah, but why shouldn’t we all be paying the full price for the environmental inputs and services we use every day? We do not expect to receive for free other inputs to production. The only difference here is that environmental goods and services are treated like they are free. As if they have no other value. Think about what generally happens when things are given away for free. How are freebies often treated? Treating natural resource inputs as free leads to their

overuse, and the environment as society’s waste disposal dump, with far reaching consequences. Industrial waste and agricultural runoff contamination of lakes and rivers eventually ends up in drinking water. Situations like this have caused tremendous costs to several regions in the United States and different parts of society - causing harm especially to young children.

Clearly, the potential health effects to humans justifies pollution control policies. Using an economic lens to view environmental externalities, we note further costs of environmental damage. Externalities from our fertilizer run-off example

Story Continues

are a cost to businesses affected by the loss of fishing and local tourism, and to laid off employees who rely on unemployment checks as they look for new jobs.

Individuals who become ill from swimming in water with excess bacteria, or drinking water with too much nitrogen and phosphorus incur medical expenses, and their employers lose productivity. These losses in turn affect the broader economy through a large number of market-based interlinkages.

Let's bring this idea of external costs transmitted through environmental effects closer to home. Imagine that in your community the amount of curbside garbage collected from households has risen in recent years – your free curbside trash collection was covered by the municipality from general taxes. The community must vote on one of two means to cover the costs. One is to institute new household-level fees for each bag of trash collected. The other is to invest in a municipal trash-to-energy program that would incinerate household wastes to generate electricity, which can then be sold, with no increase needed in costs to households. How would you have voted? Suppose that your community votes for the latter - the problem of increasing costs for trash pick-up is solved at no new net cost to households! Ta-Da!

How would you have voted if you were informed that the trash-to-energy incinerator emits air pollution? Can you see where the external costs are – the costs that are not directly taken into account by individual decision makers? There are two external costs: one is the cost of air pollution from the incinerator, and the second is the original cost of trash collection – individual homes not being charged their full costs of waste disposal leaves an incentive to generate trash without having to consider the costs.

A weekly by the bag fee for trash removal would also have generated incentives to reduce the amount of trash produced. An economist is trained to have the tools to identify the problems of external costs and to suggest solutions to bring into alignment benefits, costs and incentives.

Let's consider an example close to home. The American Lung Association's 2019 State of the Air Report gave every single county in Connecticut a failing air quality grade. This directly corresponds to higher rates of asthma, chronic obstructive pulmonary disease (COPD), lung cancer and other diseases. Connecticut also received an "F" from Environment America's "Get the Lead Out" campaign, which measures lead levels in public school drinking water. Somewhere, somehow, these contaminants have made their way into our air and water. The sources of these contaminants are human activities and decisions. Where the costs borne by Connecticut residents affected by air and water quality likely included in the original decisions?

Or did decisions that lead to these failing grades consider only the costs of pollution control? The costs of changing out lead pipes would fall on regional water authorities, municipalities, and intimately the households paying higher water bills and taxes to upgrade infrastructure that has not been upgraded for a century in many places. The costs of reducing air pollution may include limiting options for trash incinerators that reduce costs of trash collection. Where these the main costs that figured into decisions? If so, then we are all worse off, and all bearing external costs transmitted through environmental changes – because environmental serves were treated as "free" – without considering the cost.

Society relies on our environmental assets for our very existence. You likely are correctly pointing out that the needs of society require some level of use of these assets – a level of use that balances the benefits to society with the full costs to people today and to future generations. A key component to understanding and finding a balanced use is to identify external costs, and to find methods for incorporating these explicitly into our decision making. An economic analysis would not find fault with some level of nutrients from fertilizers entering water ways; nor some level of ore mined to produce household utensils, machinery, cars; nor some amount of forested lands to be cleared for agricultural lands; nor even some level of emissions into the air.

The economist would seek to understand the levels of environmental use and protection that achieve a balance, where ALL costs are taken into account in every single decision and action. Resource economists estimate costs of pollution, the benefits of cleaning up pollution, and the costs to firms to adopt pollution abating production processes and waste disposal methods. Economists are trained to know how to determine the magnitude of external costs, and on the design of market-based methods to eliminate external costs by bringing these costs directly into individual decision-making. Economists play a key role in the development of practical solutions to improve human quality of life, through improved environmental quality.

Economic analysis is essential to advise governments on setting limits for environmental damages, which policies are most likely to achieve these limits at minimum cost, while considering the distribution of these costs.

A LITTLE BIT ABOUT THE AUTHOR...

Policies that internalize costs through fees (pollution taxes) generate revenue that can be invested in needed public infrastructure and social programs – perhaps even offsetting income taxes that have traditionally been used for these purposes. Market-based policies that incorporate environmental costs into decisions (through fees and 'cap and trade' programs) incentivize companies to innovate new solutions, opening up new paths for economic growth and development that are sustainable.

To learn more about this topic, check out these links:

US National Library of Medicine:
Runoff and Associated Pollution
<https://toxtown.nlm.nih.gov/sources-of-exposure/runoff>

Natural Resource Defense Council:
Flint Water Crisis
<https://www.nrdc.org/stories/flint-water-crisis-everything-you-need-know>

Environmental Protection Agency:
Lead Contamination
<https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>

American Lung Association: State of the Air Report (Connecticut)
<https://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/connecticut/>

Environment America: Get the Lead Out Campaign
<https://environmentamerica.org/feature/ame/get-lead-out-0>



Julia Ward is a sophomore majoring in Applied and Resource Economics with a concentration in International Development at the University of Connecticut College of Agriculture, Health and Natural Resources Department of Agricultural and Resource Economics. Her favorite quote is:

"Change Begins with a Question"

- Lindy Elkins-Tanton