

Scarcity and Tragedy of the Commons

Today's Reflection: The student sighed, "There are just not enough hours in the day." I am sure you have heard the words before or said those very same words yourself. There are just not enough hours in the day or enough dollars in our pockets or enough weeks in a year. We always want more, more time and more money. If we could just have more, we could get everything we wanted done and have everything we wanted. But that is not the nature of life. The nature of life is that our wants and desires are always greater than our resources. We always want more than we have. If we lived in a magical world, we could wave our magical wands and never need to study Economics because we would have all of our hearts' desires fulfilled. Yet there is no magical wand. There are only so many hours in a day and only so many dollars in our pockets. The world is a world of limited resources and our minds are minds of unlimited desires.

Scarcity and finite resources are a fundamental reality of life. In Economics, scarcity is the realization that there are limited quantities of resources to meet unlimited wants and desires. As a result of scarcity, individuals have to make choices. How will we spend our 24 hours every day? How will we spend the money in our wallets? Yes, Economics is the study of the choices we make because scarcity exists and those choices impact our environment.

Today's Key Terms:

Aquifer:

- An underground layer of permeable rock, rock fractures, or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted.

Surface Water:

- Water found on the Earth's surface, such as in rivers, lakes, and reservoirs, as opposed to groundwater.

Groundwater:

- Water held underground in the soil or in pores and crevices in rock.

Water Table:

- The level below the Earth's surface at which the ground becomes saturated with water.

Drought:

- A prolonged period of abnormally low rainfall, leading to a shortage of water.

Externalities:

- The side effects or costs/benefits that affect a third party who is not directly involved in a transaction or decision (A cost or benefit caused by a producer that the producer does not pay for or benefit from). In the context of water, a farmer's pumping decisions can have external effects on other water users.

Scarcity:

- The fundamental economic problem of having seemingly unlimited human wants and needs in a world of limited resources. In this context, water is a scarce resource.

Tragedy of the Commons:

- An economic theory where individuals acting independently and rationally according to their own self-interest behave contrary to the common good of all users by depleting or spoiling a shared resource.

Rival Good:

- A good whose consumption by one person prevents consumption by another. Water is a rival good; if one person uses it, another cannot.

Non-excludable Good:

- A good that is difficult or impossible to prevent people from consuming, even if they don't pay for it. Groundwater, before regulation, was largely non-excludable as anyone with a well could access it.

Prices (Economic Solution):

- A mechanism to manage scarce resources by assigning a monetary cost to their use, thereby incentivizing reduced consumption (e.g., a water tax).

Quantities (Economic Solution):

- A mechanism to manage scarce resources by setting direct limits on how much can be used or extracted (e.g., water allotments, caps).

Cap and Trade:

- An environmental policy tool that sets a total limit (cap) on the amount of a specific resource that can be used or pollutant that can be emitted, and then allows entities to buy and sell (trade) permits to use or emit that resource/pollutant up to the cap.

Economics:

- The study of choice
- The study of how people satisfy their wants and needs by making choices'

Need:

- Is something like air, food, or shelter; it is something that is necessary for survival

Want:

- A want is an item that we desire; a want is not essential for survival

Goods and Services:

- Goods are physical objects such as clothes or shoes; services are actions or activities that one person performs for another person

Shortage:

- While every good and service is scarce because all resources are scarce, a shortage refers to a situation where a good or service that is normally available is suddenly unavailable
- Scarcity is permanent but shortages are temporary
- Wars or droughts can lead to shortages
- Shortages can lead to high prices due to insufficient supplies

Podcast: <https://www.npr.org/2020/07/28/896308345/summer-school-4-pistachios-scarcity> AND <https://www.npr.org/2021/07/22/1019483661/without-enough-water-to-go-around-farmers-in-california-are-exhausting-aquifers>

Basic Questions:

What is an aquifer?

How much is the water dropping per week?

How deep were the wells before?

How deep are some now?

What are the best estimates for how much water is left in the central valley aquifer.

Can we have everything we want? Explain.

Create a list of five choices you've made in the past twenty-four hours that have impact on the commons:

What is the difference between a need and a want?

Provide examples of your needs:

Identify examples of your wants:

How do goods differ from services?

Give two examples of goods.

1.

2.

Give two examples of services:

1.

2.

What is a shortage?

How does a shortage differ from scarcity?

How do individual incentives conflict with collective interests in managing shared resources?

Higher Order Thinking Questions (taking basic knowledge and applying it)

1. Why are California farmers currently relying so heavily on groundwater, and what is the consequence of this reliance?
2. Explain the "lie of a place" that Mark Arax refers to in the context of California's water usage.
3. What is an "externality" in economic terms, and how is it illustrated by the example of groundwater pumping in California?
4. How do economists define the "tragedy of the commons," and why does the Central Valley's water situation fit this description?
5. Why are highly profitable crops like pistachios and almonds contributing significantly to the groundwater depletion problem?
6. Describe the dilemma faced by farmers like Mark Watte regarding planting water-intensive crops during a drought.
7. What is Elinor Ostrom's alternative solution to the tragedy of the commons, and what are its limitations in the California context?
8. Explain the two main economic solutions (prices and quantities) that economists propose to address the overconsumption of scarce resources like water.
9. How does the concept of "cap and trade" apply to water management, and what is its main benefit?

10. What is the significance of the 2015 California law mentioned at the end of the "California's Thirsty Farms" source, and how does it relate to the solutions discussed in "Scarcity, Externalities, and the Tragedy of the Commons"?

Higher Order Thinking Questions (College Level)

1. Analyze the role of economic incentives in driving the California groundwater crisis. Discuss how profitability, market demand, and the lack of pricing for water contribute to the "tragedy of the commons" in the Central Valley.
2. Compare and contrast the immediate impacts of groundwater depletion on different stakeholders in California, such as individual homeowners, small farmers, and large agricultural operations/hedge funds. How do these differential impacts reflect the concept of externalities?
3. Evaluate the effectiveness of the two main types of solutions proposed by economists—prices (e.g., water taxes) and quantities (e.g., cap and trade, direct limits)—in addressing the California water crisis. What are the potential advantages and disadvantages of each approach?
4. Discuss the challenges and potential for "self-governance" or community-led solutions to the tragedy of the commons in the context of California's agricultural sector, as theorized by Elinor Ostrom. Why is achieving consensus difficult, and what factors might make it more or less likely to succeed?
5. The sources suggest that the California water crisis could serve as an example for other parts of the country and for global issues like climate change. Explain how the economic principles and solutions discussed in relation to California's groundwater could be applied to broader environmental challenges.

Big Idea Question

1. How do individual incentives conflict with collective interests in managing shared resources?