

CASE STUDY - UNIT 4

The Case of the Waylaid Water

Teaching Instructions

Overview

In this case study about drought conditions in a California community, students learn that water is a scarce resource responding to the laws of supply and demand. Specifically, if communities choose to hold down the price of water below market levels, we can expect shortages.



Learning Objectives

After completing this case study, students will be able to:

1. Explain that every choice involves an opportunity cost.
2. Distinguish shortage from scarcity.
3. Show that a price of zero will cause a shortage of a scarce resource like water.
4. Demonstrate that there is an inverse relationship between the price charges for a good or service and the quantity that people will choose to buy. (Law of Demand)

Prerequisite Skills

Students must know how to apply the Five-Step (PACED) decision-making model used in many curriculum materials of the National Council on Economic Education (www.ncee.net). This involves making decisions based on personal and group criteria/goals and communicating ideas in a group setting.



Important Concepts To Emphasize

1. **Scarcity and shortage are not the same thing.** Water, like any other economic good, is scarce. This means simply that at a zero price, there is not enough for everyone to have all that they want. However, a shortage of water or any other good or service means that at the current price, people want to buy more than suppliers want to sell. In short, scarcity is a fact of life that is always with us; shortages, however, result from our efforts to hold prices below the level that will equate the quantity supplied with the quantity demanded.
2. **Rationing does not “solve” the problem of scarcity.** It simply provides an alternative to price increases as a way to restrict consumption in response to a shortage. In fact, price hikes are actually a form of rationing, albeit, carried out by the market rather than government. Whether through mandated rationing or price hikes, someone has to make the decision of how to cut consumption (and by whom) when quantity demanded exceeds quantity supplied.
3. **The Law of Demand holds for water, just as it does for other goods and services.** This means only that people tend to buy more at a lower price and less at a higher price. Therefore, if the price is allowed to rise during a drought, there need not be a water *shortage* since people have an incentive to conserve water when the price rises. Furthermore, at a higher price, producers have an incentive to provide more water.



Teaching Suggestions

1. Review the Five-Step (**PACED**), decision-making model. 1. Define the **P**roblem; 2. List **A**lternatives; 3. Identify **C**riteria/Goals 4. **E**valuate Alternatives Against the Criteria; 5. Make a **D**ecision. Show students how to use the Decision-Making Grid. (See end of lesson.)
2. Hand out the Case of the Waylaid Water scenario and decision-making worksheet and grid to your students, then ask them to evaluate each of the options, filling in the alternatives and criteria they think are important. You

may wish to divide the class into special interest groups, each supporting a different alternative.

3. As a homework assignment, ask students to find out how much they pay for water and how much water their family uses in an average month. Point out that many cities have had large increases in water and sewage rates to pay for repairs to the deteriorating infrastructure. Ask them to find out what the family's response would be to a doubling of water rates.
4. If time permits, ask the students to complete a *Graphing a Demand Curve* survey form relating water consumption to price. You can combine responses for the entire class to get an overall demand schedule for water. To do so, simply add together all of the quantities students reportedly would consume at each price level on the survey form. The result will show an inverse relation between price and quantity used - as price rises, students' consumption of water will fall.
5. Show the movie or assign the book, *The Milagro Beanfield War* (1974), by John T. Nichols and discuss the property rights of the developers versus those of the townspeople. Use the story to explain the costs and benefits of reallocation of resources, in this case, from bean production to rational use of land.



Key Questions To Ask Students

1. Scarcity fundamentally means that due to limited resources, individuals can't have everything they want. Is water scarce? If so, does this mean we will always have water shortages? In the case study, do you think Sacramento would have a water shortage if everyone had to pay \$10/gallon for water?

(Yes, water is scarce. At a zero price, there is not enough to satisfy everyone's want for water. However, this does not mean that there must be a water shortage. This is because at a high enough price, the quantity of water that consumers are willing and able to purchase will not exceed the quantity suppliers are willing to supply. At a price of \$10 per gallon, there would certainly not be a water shortage since people would use far less water. They would stop washing cars, watering lawns, and might even take fewer showers! At that price, too, suppliers would be willing to supply more water!)

2. Do the results from the Graphing a Demand Curve activity/survey suggest that raising the price can be an effective way to eliminate a shortage and conserve water? What else could eliminate a water shortage? What are the advantages of using the market approach, i.e., raising the price to encourage conservation? What are the disadvantages?

(Although the actual survey results will vary from class to class, the responses by any given class will support the Law of Demand. Students will buy less water when the price rises. Another way to eliminate the shortage would be to ration water usage through ways such as mandated restrictions on lawn or car watering. The market approach has the advantage of permitting residents maximum freedom to decide which way they will choose to conserve. The disadvantage is that some people with relatively low incomes may find it difficult to pay their water bills.)



Other Teaching Materials

This case study was derived from "Water Rights in California: A Problem of Scarcity!" Module 2, Chapter 2, in *Economic Education Mandate: Handbook for Survival*, published by the California Council on Economic Education and the California Department of Education, 1991.

DECISION-MAKING GRID ANSWER KEY

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CRITERIA

	Will limit consumption	Fairness	Freedom	Start-up costs	
ALTERNATIVES					
Ban watering	+	-	--	+	
Limit usage to 100 gallons	+	-	-	+	
Water meters	+	+	+	-	
Do nothing	--	-	+	+	

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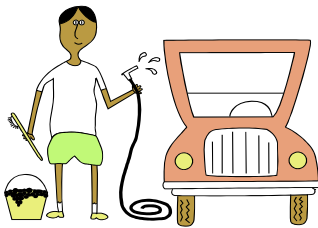


Student Directions:

Bill, Anne, and Eduardo need your help. They cannot resolve the question of how to eliminate their city's water crisis. Read the scenario, then, decide what criteria or goals you should use to evaluate the alternatives. Complete the Decision Worksheet and the Decision Grid to help you decide which choice you feel would be best for Sacramento. Your teacher may want for you to fill out a survey on the demand for water. If so, follow the directions on the survey form and fill in the amounts of water you would use at various prices. Draw your demand for water on the graph. Your teacher may combine your demand with that of other students to get the total demand for water of your class.

Scenario:

Anne, Bill, and Eduardo live in Sacramento, California. Because of a drought that has continued for more than five years, their city is considering water rationing. Unless people cut back voluntarily, the city will be forced to take other measures. "Why don't we just ban lawn watering and car washing until the drought ends," suggested Bill. Anne, whose parents own a landscaping business, responded, "That



would put my family out of work, and besides, people don't like to see their grass turn brown. Why, in some towns, people are actually painting their dead grass green! Don't you think people have a right to water their lawns?" Bill, who usually gets stuck mowing the lawn, thought that painted grass sounded like a great idea.

Anne's friend, Eduardo, thinks that the fair thing to do is to install water meters and charge people according to how much water they use, as is done in other parts of the country. "I don't think that would help," responded Anne. "People are already trying to cut back as much as they can."

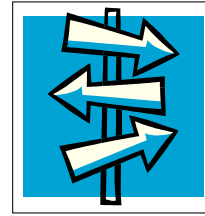
"I don't agree," said Eduardo. "If people were charged for what they use, they definitely would cut back!"

Bill suggested limiting each household to 100 gallons of water per day until the drought ends. "But that's not fair," says Amy. "Large families and those with lots of grass to water wouldn't have enough water, while some people wouldn't even need their share. And what about farmers who have to irrigate their crops?"

Bill, Anne, and Eduardo continued to argue without settling anything. "Look," said Anne, "each of us has a parent on the city council. Let's do a survey to find out if charging for water would make a difference. If so, I am willing to change my mind. And if we take the survey results to our parents, maybe it will help them decide." So they all agreed to collect some information from others in the community and share the results with the city council.



Decision Worksheet



Student Directions

1. Complete this worksheet and the Decision-Making Grid to help you analyze the case study.
2. (Optional) Below the evaluation marks you place in each cell of the decision-making grid, make a brief comment explaining **why** you made a particular mark.

Step 1: Define the **P**roblem

Step 2: List **A**lternative Solutions

Step 3: List Important **C**riteria

Step 4: **E**valuate Alternative Solutions

(Fill in the individual cells in the decision-making grid.)

Step 5: Make a **D**ecision

(Which alternative do you think is the best solution?)
