*The Wicked Problem of Water Quality in the Mississippi River Watershed*

**Externalities, Public Goods, and Common Resources – Navigating the market equilibrium**



Consider our new understanding of what makes water quality a “wicked problem” using the example of the **Mississippi River Watershed. In particular, focus on the SDGs related to clean water & sanitation and sustainable cities & communities.**

By the end of the exercise, you will be able to:

1. **Design** a policy for government intervention in the market for using water in a community.
2. **Predict** and **explain** how stakeholders may change their behavior in response to the policy: firms, households, schools, etc.

**Recall the following Stakeholder groups represented at the Town Meeting on Nitrogen in Mississippi River**

1. Family farms in the upper Midwest with large acreages of corn and soybean fields
2. Fisheries industry that relies on fish harvest from the Gulf of Mexico
3. Municipalities for which you must supply drinking water to the residents and treat all of the sewage
4. Citizens of Misiziibi whom have seen rates for water and sewage increase over the last 10 years, hear a lot about nitrogen pollution in the Misiziibi water supply, and are worried about the health effects
5. Small brewery that wants to expand its operations due to increasing beer consumption in the region
6. Local non-governmental organization (NGO) that wants to protect a local endangered aquatic plants and habitat for riparian zone (riverside and floodplain) flora and fauna

**Keep in mind the *revised* Stakeholder Map we created together as a class.**

1. Consider the following four markets:
   1. **Group 1:** Agricultural: corn
   2. **Group 2:** Fishing
   3. **Group 3:** Breweries/beer
   4. **Group 4:** Drinking water
2. For your assigned industry, define the equilibrium in the private market outcome
   1. Draw the supply and demand diagram for the good/service in question. Label the quantity axis as you see fit. Define the price-per-unit as appropriate.
   2. Define who makes up the “supply” side and who makes up the “demand” side of the market.
   3. Label the equilibrium price and quantity.
   4. Label the consumer and producer surplus.
   5. Assess the allocation of the total surplus amongst stakeholders in question.
3. Consider the social costs and benefits of this industry
   1. Brainstorm potential externalities that exist in the market.
   2. How can you classify the good/service in question (i.e. common resource, public good, private good, etc.)?
   3. Which side of the market likely experiences the externality and how is this internalized by the market?
   4. How does the private outcome compare with the socially optimal outcome?
4. Design an appropriate government intervention
   1. How can the government use policies to achieve an improvement in overall social welfare?
   2. How are surpluses affected and/or reallocated? Consider the elasticity of each side of the market.
   3. Do you think these policies are feasible?