

The Economic Sustainability Paradigm and Freshwater and Marine Fisheries Governance

R. Quentin Grafton and Dale Squires

ECON 267

The Common-Pool Resource Problem

- Market failure: Inability of existing markets to allocate common-pool resources efficiently
- Arises because users do not bear all the costs of their actions on others (depletion of aquifer or fish stock) when they decide how much water to extract/fish to catch... no market mechanism to 'internalize' uncompensated costs.
- Classic "tragedy of the commons" ... but not to the point of exhaustion (increase in required effort diminishes the value/surplus from the resource).

Current Institutions/Laws Create Perverse Incentives

- UN 'Law of the Sea' leads to unrestricted entry.
 - ▶ High seas become 'open-access' resource
- Voluntary multilateral cooperation through fishery management organizations becomes difficult
 - ▶ Management decisions become allocation decisions (leads to fighting over the details of the management system because every decision is going to effect someone differently).
- All of this creates perverse incentives to increase fishing effort and loosen conservation controls.

The Traditional Methods of Regulation: Command-and-Control

- Input controls: Limit inputs that comprise effort (standards of quality, quantity and design... fishing gear specifications, number/size of boats)
 - ▶ This still fails to prevent overcapacity as it creates perverse incentives to circumvent the regulation by expanding the unregulated inputs.
- Output controls: Total allowable catch, permits, individual/group quotas, performance standards (bycatch quotas for commercial fishing)
 - ▶ Still can create perverse "race to fish" incentive (catch as much as you can as soon as you can)

The Future Under Command-and-Control Regulation

- Without restructured institutions, laws and incentives the "endgame" is one of overfishing, decline in fish stocks, decline in economic benefits (reduced employment, profitability, coastal communities that no longer have a viable industry)

The Issues With Water

- The dynamic characteristics of water means that allocation decisions are more complex than for other renewable and non-renewable resources. Efficient and equitable allocation of water requires different management strategies depending on the context.
 - ▶ Allocating groundwater (aquifers) is primarily concerned with the optimal time and rate at which to deplete the resource... surface water management deals with how to allocate ongoing water flows between competing uses (fisheries, agriculture, recreation, etc).

The Issues With Water

- Use of water resources can have wider impacts that market prices do not take into account, can generate significant positive technological externalities.
 - ▶ Dams can reduce the impacts of flooding by storing water, also provide water for recreational purposes/consumption... but also impose negative externality via altering downstream flows to the detriment of water users and environmental costs (salmon population decline)
- Often difficult to exclude individuals from accessing the benefits of water infrastructure once they are implemented (estimated 40 percent of sewer connections in Cairo are illegal).

The Issues With Water

- Trying to balance supply and demand with marketable goods is typically done through markets and market prices... but water's open-access nature, lack of property rights and external public benefits creates imbalances in supply/demand that aren't corrected in markets. This leads to 2 issues:
 - ▶ Inefficient levels of use: Typically overuse. We see it in aquifers (extraction rate greater than recharge rate). Over-extraction typical in common-pool resources.
 - ▶ Inefficient allocations of use: not allocated to their most highly valued uses. Usually occurs when there is a lack of property rights (access to water resources cannot be marketed across competing uses).

Solutions to the Issues With Water

- Setting water prices (price per unit of water used/extracted)
 - ▶ Should be based on the scarcity of the resource, but we often see water use heavily subsidized (want to ensure access to low-income households? Ensure agricultural production?).
 - ▶ Water abstraction charge (tax on amount withdrawn by ea user).

Solutions to the Issues With Water

- Establishing water markets to encourage efficient allocation
 - ▶ Set fixed cap on the amount of water that can be withdrawn, create trade-able property rights for access to the available water.
 - ▶ Rights can be created in terms of quality, allowing trade in attributes like salinity or biological demand.
 - ▶ Requires a regulator/authority to set a cap on total use and allow trade subject to sustainable constraints. Ideally trade would promote allocation to the users who value it most highly.

Policy Options

- Sustainability Targets
 - ▶ Economically efficient 'caps' of overall use/harvests. Ideally should include the public-good benefits associated with biodiversity and ecosystem services and recognize that no-growth equilibria is illusory and generates targets that reduce social welfare.
- Multilateral Cooperation
 - ▶ Coordination for transboundary common resources and public goods that include self-enforcing voluntary agreements.
- Competitive Market Prices of Resource Rights and Access
 - ▶ Signals the scarcity value of extracted resource to users, promotes more efficient use.

Policy Options

- Well-Placed Marine Reserves Protected Wetlands, Catchment Basins
 - ▶ Promotes resilience, can allow resources to recover quickly from adverse events, provide values to resource users, enhances the delivery of ecosystem services
- Payments to Resource Users
 - ▶ Can be a cost-effective way to promote the public-good benefits of resources, including ecosystem services.
- Instruments for Information Externality
 - ▶ Eco-labeling/certifications, information programs, green public procurement (e.g. of sustainably harvested fish)

Implementation for Successful Allocation

- Clearly define and bound the rights to be allocated
- Agree on whom the rights are allocated to and establish transferability mechanisms
- Set up a mechanism for effective monitoring, compliance and enforcement
- Maintain transparency