Bottling Groundwater for Sale in Mecosta County, Michigan

- Ice Mountain, a division of Nestle Waters North America, has been pumping groundwater in Mecosta County, about 50 miles north of Grand Rapids, Michigan.
- It operates 4 wells in Mecosta County’s Morton Township and pumps the water about 13 miles southwest to the plant.
- The water comes from an aquifer that is part of the west branch of the Little Muskego River watershed.

Questions

- Why did the Michigan Citizens for Water Conservation file a suit?
- Does Ice Mountain have the right to use the water?
- Who owns the water in the area?
- What is the value of water?
- What are the values of ecosystems in the area?
- How would you make the decision?
Natural Resource

• An abstraction reflecting human appraisal of function or operation that a thing or substance in nature may perform. It includes land, water, air, mineral, energy, and organisms below and above the earth’s surface.

Types of Natural Resources

Fund resources: resources that occur with fixed or finite supplies in nature (coal, oil, mineral, etc.).

Flow resources: resources that occur in predictable flows over time, self-renewing, but can seldom be stored or saved for later use (precipitation, tides, sunlight, and climate).

Types of Natural Resources

Biological resources (organisms including plants and animals): a composite group of resources that have both fund and flow characteristics.

Types of Natural Resources

– Common Property Resources: Resources that are accessible and usable by every individual, no one can exercise proprietary ownership rights by excluding others from the right to use of the resources (air, sunlight, water in streams, open sea, radio spectrum, wildlife and fish, wilderness areas).

The multiple attributes of natural resources:

• Quantity: the amount of a resource.
• Quality: the relative ability of a resource to produce desired products, returns, or satisfactions.
• Time: the distribution of a resource over time.
• Space: the distribution of a resource over space.

Attributes of natural resources

• Scarcity: The amount of resources available is limited relative to the amount demanded.
• Allocation: designating a resource for a specific use.
Attributes of natural resources

- Technology: the capability to explore and use natural resources.
  - e.g. the 1st steam locomotive in 1796;
  - 1st steamship to cross Atlantic in 1819;
  - Henry Ford 1913 1st automobile assembly line; Frank Whittle’s 1st jet engine in 1937; 1939 development of polyethylene and DDT;
  - and 1961 development of silicon chip, etc.

- Economics: the beneficial use of resources to realize a surplus of returns above the production costs.

But the feel simple bundle of rights does not include the four important rights: 1) public right of taxation, 2) taking the land for public use, 3) regulation, and 4) escheat (reversion of the land to the state when no heirs found).

Equality: Every person is entitled to equal access to the natural resources irrespective of who or what he or she may be.
Nature-Centered View of NRM

• Human is part of ecosystem and co-exists with other species.
• Nature is the basis of the resource base human enjoys.
• The needs of future generations.
• Increasing demands and consumption

A Human-Centered View of NRM

• Quality of life for all human.
• Ability of humans to create goods from the natural resources.
• Economic development to reduce the gap between rich and poor countries.

Key Concepts

• Exhaustion: the state or condition in which extraction (use) falls to zero.

• Carrying Capacity: The maximum number of organisms that can be nourished by the resources in a given area on a sustainable basis. fertilizer, solar energy

Key Concepts

• Human carrying capacity: the maximum population density a society is capable of supporting permanently in a given environment without damage to the land.
Key Concepts

- Land Use Capacity: the relative ability of a given unit of land resource to produce a surplus of returns and/or satisfaction above the costs of utilities. Land resources are at their highest and best use when they are used in a manner that provide the optimum return to the operator or to society.

Key Concepts

- Conservation: wise uses of natural resources on a long term basis.
- Preservation: set something aside for future use, or keep something intact.

Key Concepts

- Environment: a combination of objects surrounding a subject and acting upon it is considered the environment of the subject.
- Restoration: return the state of an object or objects to the original state.

Key Concepts

- Rehabilitation: making or converting an object or a group of objects to its/their desirable state.
- Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environmental and Development 1987:43).
Sustainability

- A continuing process of mediation among social, economic, and environmental needs which results in positive socioeconomic change that does not undermine the ecological and social systems upon which communities and society are dependent (Carley and Christie 1993:48).

Indicators

- How to measure sustainability?
- Educational level?
- Income?
- Consumption?
- Recycling ratio?

Key Concepts

- Externalities: social costs or benefits. Positive externalities are benefits to the society in the form of scenery, increased accessibility, or added facilities for others. Negative externalities add cost to the society such as air or water pollution, the generation of chemical and toxic wastes, or the destruction of scenic resources.

Key Concepts

Development: the process in which increasingly more members of a given area or environment make and implement socially responsible decisions, the probable consequence of which is an increase in the life changes of some people, without a decrease in the life chances of others.
Key Concepts

Development means increasing the capacity for production which depends on the structures in a society. From geographic perspective, development is a social process, a creator and organizer of space, spatial structure and spatial organization.

Value of Natural Resources

- Natural resources are raw materials that generally have a lower value per unit than other commodities due to little or no human labor input.
- Supply is relatively inelastic over short periods of time, e.g. investment in mining.
- Fluctuations in prices, e.g. oil prices.

Value of Natural Resources

- Incommensurables: effects (both benefits and costs) that cannot readily be translated into a monetary value or price. Air, sunlight, or scenery.
- Intangibles: incommensurables that cannot be measured at all, e.g. oxygen.

Value of Natural Resources

- Willingness to pay- contingent valuation method by questionnaires.
- Proxy value (value of similar resources elsewhere) – travel-cost method, e.g. hunting or camping.
- Replacement cost – cleanup cost.

Discussion Questions

- What is the role of natural resources in improving quality of life?
- How to quantify the value of a natural resource?
- How to deal with the relationship between economic development and environment management?
- How to define, measure, and ensure sustainable development?
Discussion Questions for Next Week

• What lessons can we learn from the U.S. environmental policies?
• How much impact do governmental policies and regulations have on natural resources management?
• How are governmental policies/decisions made?
• How to evaluate governmental policies?