1.011 Project Evaluation
CEE Projects and Quality of Life: Case Studies

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1. Textile mills in Lowell and New England
2. Chain of Rocks Water Treatment Plant, St Louis
3. Sewerage Treatment in Milwaukee

Quality of Life: What is Involved?

- Basics
  - Clean water
  - Waste removal
  - Food & clothing
  - Shelter
- Availability of jobs
  - Safety, workload, long-term risks
- Aesthetics
  - Appearance of major buildings
- Activities (cultural, spritual, sports, recreation)

Quality of Life: How Measured?

- Essentials
  - Are we willing to pay what it will cost? or will we move elsewhere? or will we restrict growth?
  - Will we be willing to pay if new technology offers cheaper solutions?
- Non-Essentials
  - Willingness to pay
  - Political decisions for public projects
  - Political quidelines for private projects (zoning, building codes, etc.)

Comparison of Cases

	Lowell	St. Louis	Milwaukee
Driving Force	Textile Technology	Clean Water	Reduce Pollution
Financing	Private	Public	Public
Result	Quality of Life in New City	Ability of City to Grow; Reduced Threats of Disease	Elimination of Nuisance & Threats of Disease
Long-Term	Competition Reduces Arch. & Quality of Mill Life	Modern Water Treatment in US	Increasing Environemental Awareness

Textiles in New England

- Technological Motivation
  - Development of power loom for textiles
    - Vastly cheaper process allows mass production & distribution of clothing
    - Vastly cheaper clothing allows individuals to buy more clothes
  - Need water power to run the looms
- Project Motivation
  - RI and MA introduced power loom to US
  - Mills must be located where there is water power
  - Need people to move to where mills are located
  - US developers didn't want to repeat worst excesses of industrial revolution in England (working & living conditios)
- Lowell (1822 - 1880)
  - Symbol of best of US industrialization - efficient, beautiful mills; pleasant living conditions; open space and parks
  - One of few sites that Dickens visited in trip to US

Expansion Throughout New England

- Phenomenally successful textile industry
  - New mills in Lowell and Lawrence, MA
  - New mills in Blackstone Valley, MA and RI
  - Highly profitable, which allowed:
    - Stately buildings, classic towers
    - Excellent housing & parks
- Competition led to lower prices & profits
  - Need to cut costs
    - Larger, less aesthetically pleasing mills
    - Fill in open spaces with more housing or mills
    - Cut back on wages & amenities for workers (immigrant labor)
  - Rising demand
    - More capacity needed

Expansion to South

- New technology - electric power
  - Eliminate dependence on water power
  - Allow even larger mills
- Institutional changes
  - Unions in north fight for better work conditions
- Population shifts
  - Rapid growth in midwest and south
- South seen as preferred location for investment in textiles

Expansion Worldwide

- Globalization of the economy
  - Very cheap transport (containers)
  - Highly mobile capital
  - Very cheap skilled labor in developing countries
  - Ubiquitous availability of electricity
- New textile mills constructed outside of US near cheap labor
- Demand - cheaper clothing results in individuals owning many much more clothing

Water Quality Examples: Chain of Rocks Water Purification Plant, St. Louis

- Motivation
  - Provide clean water supplies for city
  - Eliminate silt and sediment
  - Eliminate bacteria - typhoid and cholera outbreaks
- Major option
  - Treat available water (Mississippi River) vs. bringing in clean water
- Chain of Rocks Water Purification Plant (1829 to 1915)
  - First "full treatment" water purification facility in US
  - Settling tanks, sand filtration, & flocculation to remove sediments and pollutants
  - Chemical disinfection (chlorine)

Sewerage Treatment - Milwaukee

- Motivation
  - City at confluence of 3 rivers flowing into bay of Lake Michigan
  - Combined storm and sanitary drainage created increasing pollution as city grew
- Planning and panels (1879, 1889, 1911)
  - By 1911, problem viewed as health threat, not just aesthetics
  - 1913 - state created a "Sewerage Commission"
- Construct treatment plants
  - 1919-29 - Jones Island treatment plant
    - Filtration to remove large solids; activated sludge to remove "virtually all remaining pollutants"
    - Consolidation of sludge into fertilizer
  - South Shore Plant - no longer created fertilizer because of concerns about safety

Water Quality - Comments

- Awareness of problem and technical solutions evolved over a period of decades
- New technology was key to solution
- As immediate problems are solved, others emerge
  - Is sludge safe to use as fertilizer?
  - Can we limit water use via pricing so as to reduce required capacity?
  - How much water is needed for consumption, for business, for agriculture?
  - What happens to plant and aquatic life when effluent enters the water supply? and how can effects be mitigated?