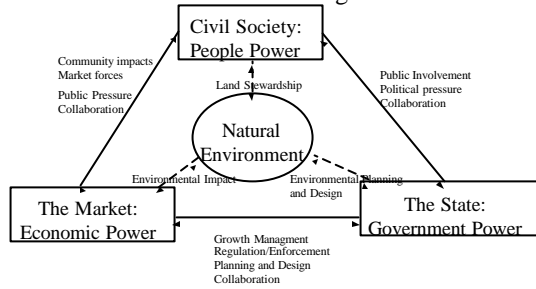


Environmental Land Use Management

- What is environmental management?



Source: Randolf, J. 2004. Environmental Land Use Planning and Management. Washington: Island Press.

Colby's Five Paradigms of Environmental Management

- Frontier Economics - *belief in infinite growth and economic prosperity*
- Environmental Protection - *"tradeoffs" exist between economic growth and protection*
- Resource Management - *sustainable or wise use of natural resources*
- Eco-Development - *co-development of humans and nature*
- Deep Ecology - *constrained harmony with nature--ecotopia*

A New Ethic for Sustainable Places

(Beatley and Manning, 1997)

Current Ethic	Ethic of Sustainable Place
Individualism, selfishness	Interdependence, community
Shortsightedness, present-oriented ethic	Farsightedness, future-oriented ethic
Greed, commodity-based	Altruism
Parochialism, atomistic	Regionalism, extra-local
Material, consumption-based	Non-material, community-based
Arrogance	Humility, caution
Anthropocentrism	Kinship

Characteristics of Sustainable Communities

(adapted from Beatley and Manning, 1997)

- 1) **Acknowledge Ecological Limits**--compact urban "footprint"--minimal conversion of natural and open lands
- 2) **Restorative and regenerative**--degraded and blighted areas are reversed/healed
- 3) **Strive for high quality of life**--livable, vibrant, and active communities that offer safety, adequate and affordable shelter, health care, essential services, humane and stimulating work environments
- 4) **Integrative and holistic**—problems are viewed comprehensively—quick fixes that address only symptoms are avoided
- 5) **"Place" Matters**--topography and natural setting, sense of history and character, rituals and events serve to build and strengthen social fabric in community
- 6) **Reflect and Promote Full-Cost Accounting of Public and Private Decisions**--reflect consequences of economic incentives/disincentives and governmental actions
- 7) **Embodies New Ethical Posture**--embraces land ethic, regional contextual, present and intergenerational equity

What is Environmental Planning?

- Planning that provides for environmental protection
 - Reactive—correct prior environmental damages
 - Proactive—actions to enhance environmental quality
 - Integrative—early and substantive consideration of environment in development plans and projects

Planning Approaches

- Rational-comprehensive
- Incremental
- Participatory
- Advocacy

Planning Processes

- Scoping
- Identification of Issues, Opportunities, Concerns, Objectives, Criteria
- Analysis of Planning Situation
- Formulation of Alternatives
- Assessment of Impacts
- Evaluation and Selection of Alternative
- Implementation, Monitoring, Evaluation, Modification (Adaptive)

Ecological Planning Method

—the use of biophysical and sociocultural information to suggest opportunities and constraints for decisionmaking about the use of the landscape

Land Use Planning Process

- 1) identification of problems and opportunities
- 2) establish goals
- 3) inventory and analysis of the biophysical environment
- 4) human community inventory and analysis
- 5) suitability analysis
- 6) development of concepts
- 7) selection of options
- 8) adoption of plan
- 9) community involvement and education
- 10) detailed design
- 11) plan implementation and administration

Interdisciplinary Considerations

- **Environmental science and engineering**—incorporate understanding of natural systems
- **Environmental Economics**—how do we value the environment?
- **Environmental Evaluation**—how do we weight environmental criteria in decision-making?
- **Environmental Politics**—how are environmental values reflected in the political process?
- **Participation, Collaboration, and Conflict Resolution**—infusing democratic principles into the planning process
- **Environmental Law**—common law, public trust doctrine, statutory, and administrative law influence environmental management

In Class Exercise

Scenario: Your consulting firm has been retained by GMC to evaluate sites for locating a new dorm facility. You are to select a site and forward a recommendation to the President. In your recommendation, you should 1) list all the criteria you consider important to the siting decision, 2) describe how you weighted or ranked the criteria in the siting decision (if you did), 3) explain how you applied your decision rule to reach your conclusion

Comprehensive Evaluation Techniques

- Maximize one criterion
- Meet minimum levels of all criteria
- Maximize one criterion while meeting minimum levels of others
- Rank criteria and maximize from high to low
- Numerically weight each criterion, rate each alternative's contribution to each criterion, and use sum-of-weighted-factors method to score each alternative

The Many Role(s) of the Planner

- Technician, information source
- Facilitator of public involvement and builder of community support, champion of citizen empowerment
- Regulator
- Negotiator, mediator of conflicts
- Political advisor or politician
- Designer, visionary
- Advocate

Environmental Planning for the Future

- Adaptive management (scientific learning)
 - Learning through experimentation, monitoring, evaluation
- Collaborative environmental decision making (social learning)
 - Collaborative learning, consensus building, conflict resolution, partnerships

What are criteria?

...evaluation standards or measures of desirability

Potential Criteria for Evaluating Land Management Alternatives

- ? Physical and biological feasibility
- ? Economic efficiency
- ? Distributional equity
- ? Social and cultural acceptability
- ? Operational practicality or administrative feasibility
- ? Legality

Physical and biological feasibility

Is the action biologically possible?

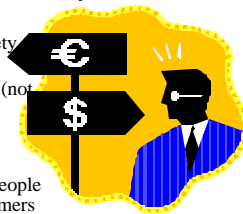
- must know physical, chemical & biological factors
- must have knowledge of current stocks (inventories of resources)
- must know rate of change in the stocks (resource flows, e.g., growth rates)



Economic efficiency

Actions should generate benefits to society that are greater than the costs

- benefits are increases in well-being (not just financial or material)
- costs include financial (cash) and opportunity costs (forgone uses)
- to implement, one must inventory people to determine their benefits as consumers and producers (usually done through markets)
- methods can be used to determine value of non-market goods
- efficiency does not tell us how benefits and costs are distributed between various segments of society



Distributional equity

Goal is to ensure a minimum level of well-being

- accomplished using tax-transfer system
- distribution effects can be shown by income groups, age categories, geographic distribution, race, or occupation



Social and cultural acceptability

How decisions affect various ethnic groups/cultures (e.g., indigenous peoples)

- social and cultural values are expressed through people's actions or choices (voting, writing letters, public involvement participation, choice of where to live and work)
- interpretations of social and cultural acceptability can change over time
- not limited to this generation (e.g., preservation of historic/archeological sites)



Operational practicality or administrative feasibility

Are the resources sufficient to perform the particular action?

- funding, personnel, and technology to achieve outcome

Legal

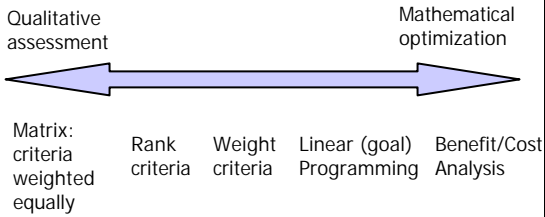
Is the action permissible under existing laws and regulations?



Integrating the Decision criteria

- 1) **matrix approach (list criteria down, alternatives across)**
 - operationalize the criteria and use performance indicators
 - use dominance criteria (pair-wise comparisons, least desirable alternatives are dropped)
 - all criteria are considered equal
 - 2) **criteria ranking approach - criteria are ranked according to importance (from least most)**
 - pairwise comparisons are done based on most important criteria .
 - 3) **weighting and multiattribute utility approaches**
 - more elaborate than "dominance" and "criteria ranking" approaches
 - weights are established for each criteria
 - normalized scores are calculated for each criteria and multiplied by the relative weights
 - determination of weights is the most important step
 - who should determine weights (agency? Interest group negotiators? Public?)
- Decision techniques that maximize one criterion, subject to minimum levels of the others
- 4) **screening approach**
 - incommensurable criteria are used as "filters" that "screen-out" alternatives that do not meet at least the minimum requirements of the criteria
 - 5) **Benefit-cost analysis approach**
 - could be implemented by (1) performing BCA on just the alternatives that meet the screening process, or (2) perform BCA combined with increasing levels of attainment of the other factors
 - 6) **Mathematical optimization**
 - selects one of the criteria and maximizes it while meeting prespecified levels of the other criteria
 - requires that each criteria or performance indicators can be represented by an equation
 - linear programming, quadratic programming, non-linear programming
 - to facilitate analysis, various outputs are often expressed in dollar units
 - objective function, constraints

Decision Criteria Continuum



Decision Matrix

Criteria \ Alternative	A	B	C	D
Biological				
Economic				
Social				
Administrative				
Equity				

Dominance Approach

Choose this Alternative

Criteria \ Alternative	A	B	C	D
Biological				Best
Economic	Best			
Social				Best
Administrative		Best		
Equity			Best	

Criteria Ranking Approach

Choose this Alternative

Criteria (Ranked) \ Alternative	A	B	C	D
2. Biological				Best
1. Economic	Best			
3. Social				Best
5. Administrative		Best		
4. Equity			Best	

Weighted Criteria Approach

Best alternative depends on criteria weights

Alternative Criteria (Weighted)	A	B	C	D
(2x) Biological				Best
(1x) Economic	Best			
(1x) Social				Best
(.5x) Administrative		Best		
(3x) Equity			Best	

Screening Approach

Alternatives

A D C B

Screening
Criteria

Minimum
Acceptable
Value

Only these
alternatives
"meet" screening
criteria

C
A