PLS 505 – Policy Analysis
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Topic: Techniques for Evaluating Alternatives

- **What is Policy Analysis?**
  - *Policy analysis* can be defined simply as the provision of policy-relevant information to decisionmakers
    - Typically this involves the systematic investigation of alternative policy options and the gathering and display of evidence for and against each option
    - It also involves the focused, systematic analysis of the outputs of governments and their effects on society
    - It looks at the connection between goals and the extent to which a given policy achieves those goals
    - This means it is a problem-solving approach, the collection and interpretation of information, and some attempt to predict the consequences of alternative courses of action
  - This definition has 4 key elements
    - Goals, including normative constraints and relative weights for the goals
    - Policies, programs, projects, decisions, options, means, or other alternatives that are available for achieving the goals
    - Relations between the policies and goals, including relations that are established in intuition, authority, statistics, observation, deduction, guesses or other means
    - Drawing a conclusion as to which policy or combination of policies is best to adopt in light of the goals, policies, and relations
  - Basic steps of policy analysis process
    - Verifying, defining, and detailing the problem
    - Establishing goals, objectives or other evaluative criteria
    - Searching for alternatives
    - Evaluating the impacts of alternative policies
    - Evaluating, comparing, and ranking the alternatives
    - Monitoring the implemented policy
    - Note the commonalities of the rational decision model

- **Wide Range of Approaches to Policy Analysis – Most of Which Rely on the Rational/Bounded Rational Decision Making Model**
  - Ration decisionmakers are value maximizers that try to reach an optimum decision given a set of constraints
    - Model of decision making is commonly attributed to economists who have a clear and consistent system of preferences, knowledge choices, and computation tools that permit the selection of the optimum choice
  - Six steps in the rational model
    - Define the problem
    - Identify decision criteria
    - Weight the criteria

  - Generate alternatives
  - Rate each alternative on each criterion
  - Compute the optimal decision
- Assumptions
  - *Problem Clarity*: problem is clear and unambiguous
  - *Known options*: decisionmakers can identify all of the alternatives and relevant decision criteria. Decisionmakers must also be aware of all of the possible consequences associated with each alternatives
  - *Clear preferences*: criteria and alternatives can be ranked and weighted to reflect and analyze their importance
  - *Constant preferences*: specific decision criteria and the weights remain stable over time
  - *No time or cost constraints*: rational decisionmakers can obtain full information about the criteria and alternatives because there are no time or cost constraints
  - *Maximum payoff*: the rational decisionmaker will choose the alternative producing the highest payoff
- Limits to strict rationality
  - Typically there is uncertainty about both means and ends
  - Can almost never clearly determine the risks and payoffs associated with each alternative
  - Rarely are all alternatives and their consequences known
  - Preferences are often unformed and changing
  - Rarely have the time, resources, energy, or mental capacity to evaluate all alternatives and their consequences
  - Too mechanical an approach to what is a much more complex process
- Bounded rationality
  - When most people are faced with complex problems, people often respond by reducing the problem to a level that is readily understood
    - When faced with a choice, most decisionmakers do not struggle to fine the best, or optimal, solution, most stop when they find the first acceptable solution – a concept Simon (1947) calls *satisficing*
  - Model recognizes the inherent limitations of the rational model
    - Problem is often not clearly defined
    - Values and goals are not always clearly defined
    - Knowledge of consequences is always fragmented, incomplete, or totally unavailable
    - Lack of information on the problem, the alternatives, the criteria, and the impact of choosing certain alternative seriously limit the judgments of decisionmakers
    - Time and cost constraints seriously limit the search for full information
    - Imperfections in humans also limit the acquisition and analysis of information
  - Concept of *satisficing* or *bounded rationality* was developed by Simon (1947)
    - For large-scale decisions the there is too much information and uncertainty which overloads the cognitive capacities of managers
    - Managers are assumed to be rational in that they try to optimize their decisions

  - They do not optimize, they *satisfice*: they search for solutions that are both satisfactory and sufficient
  - list of criteria is far from exhaustive and are looking for a solution that is good enough or will achieve an acceptable level of performance
  - A satisficing choice is the first acceptable one a decisionmaker encounters
- Advantages of Bounded Rationality
  - Theories of decision making should be based on human capacities
  - Even if the thorough search and deliberate choice associated with strict rational choice were possible, the effort might not be worth the reward due to the high decision costs it would impose
  - If the information is not immediately or readily available, adhering to the cannons of strict rationality will only encourage delay
- Steps are the same as the rational model, but there is only a limited search and evaluation of alternatives and decisionmakers "satisfice" instead of optimize

- **Limits to "Rational" Approaches to Policy Analysis**
  - Common complaint is that decisionmakers ignore the results of various types of policy analysis. Why is that?
    - Decisions are often made in a group setting rather than by individuals
    - A policy analysis report is one source of information that decisionmakers rely upon.
    - Many competing values influence decisionmakers
    - Open decision process means lots of people/organizations do policy analysis so decisionmakers are confronted with competing analyses based on similar or different data and presenting them with contrasting assumptions, alternatives, criteria, and conclusions
    - Other decision-making models help explain how decisions are made in political settings and why policy analysis sometimes has limited influence on decision making
  - Incrementalism
    - *Incremental model* is generally associated with politics and the political approach to public administration. Dual argument for its use:
      - It is the approach most characteristic of American public administration
      - It is the model that *should* be used
    - Lindbloom (1959, 1980) and others view the policy-making process as a response to short-term political conditions, by small increments, according to events and developments, and not according to rational, information-based analysis
      - Agrees with the notion of bounded rationality
      - Incremental decisionmaker is more concerned with reaching an agreement on a final outcome than making an "optimal" decision
    - Assumptions
      - Model does not assume a clear definition of goals (objectives) of decisions
    - Steps
      - Approach begins with an existing situation where means and ends are often intermixed
      - Analysis is limited and focused on alternatives that can be agreed upon or accepted

        - Decision-making process is pragmatic and concerned with reaching agreement among the parties involved
        - The decisional tools and calculations are less objective and less systematic than the rational model
            - Tends to use bargaining and compromising techniques that provide for the proportional representation of interests, minimize conflict, and lead to agreement
            - Administrators strive for satisfactory decisions after examining a rather limited set of alternatives
    - Limitations of the rational model are not strengths of the incremental model.
        - It undermines many of the traditional values of public administration such as economy, efficiency, and effectiveness
        - Often results in political alliances and power centers that dominate decision processes in organizations.
        - Often criticized for its inherent conservative outlook that seeks adjustments to the status quo and avoids radical departures
        - It is based on a bargaining concept, which often doesn't work well when resources are limited. Bargaining also obscures the real desires of participants in the decision making process. Accordingly, it can get too wrapped up in political gamesmanship
        - Incrementalists often downplay the use of models which provide clear information and delineate alternatives
        - There is a lack of imagination in that there is no way to do something "new". Only a little more or less of the same. It is inherently conservative

- **Some common pitfalls of policy analysis**
    - Faulty lesson drawing or identification of smart practices
        - Analyst assumes a policy or program that works in one setting will work equally well in another without giving careful consideration to how contextual factors influence its performance or transferability
        - If analysts want to provide sound advice for decisionmakers they need to identify the contextual factors that influence the success of the lesson or smart practice
    - Stereotyping
        - Stereotyping reduces complex choices to simplistic formulas
        - When faced with complex problems, people tend to simplify the problem. While this can help determine the important outlines of a problem, these simplifications can become one-dimensional caricatures of people and problems that can place blinders on decisionmakers. This can limit decision making
        - Examples are numerous
            - People who receive government aid are lazy welfare cheats
    - Single institutionalism
        - Analyst examines variations or different alternatives that are all variations on the same institution or policy instrument/tool without considering whether other arrangements might achieve similar objectives at equal or lesser cost
    - Ignoring the full range of transaction costs

    - Transaction costs are resources expended as a result of imperfect information.
    - They increase as the interests of policy actors become increasingly heterogeneous, jurisdictional complexity increases, and the number of bargaining partners increases.
    - They also can increase when there are asymmetries of information among actors and power differences.
    - Information, coordination costs, and strategic costs (free riding, rent seeking, shirking, corruption, turf guarding, etc.) are common types of transaction costs
    - There are transaction costs associated with making decisions about providing a service, policy, or program and making decisions/administering/providing the service, policy, or program.
- Cognitive bolstering & use of faulty logic
    - Sometimes the analyst magnifies the value of a chosen action while denigrating the value of rejected alternatives. Thus, the information search process is often narrowed by the need to justify or explain previous choices.
    - When analysts unconsciously abandon critical evaluation and exaggerate favorable consequences while failing to consider or minimizing unfavorable consequences the are engaging in cognitive bolstering
        - Achieved by exaggerating favorable consequences, minimizing unfavorable consequences, denying adverse feelings, minimizing personal responsibility, and other means
        - It represents the abandonment of critical evaluation of information which is increased by stress
        - When individuals are forced to make rapid decisions based on uncertain information and are held accountable for results, they spend considerable effort highlighting information supporting their views and suppressing information that raises doubts
    - On a conscious level, the analyst may simply use a form of faulty logic by using the negative features of other alternatives as the justification for selecting their preferred alternative without considering whether it has its own set of negative features.
- Entrapment (Escalation of Commitment)
    - Negative side of commitment. In most cases, commitment to groups and decisions is positive. Unfortunately, individuals can become committed to failures as well as successes
    - When individuals publicly announce their commitment to a course of action it becomes difficult for them to change their minds. There prestige and careers may be associated with its success or failure
    - Once commitment is made, we make every attempt to make it work. This can result in the "escalation of commitment" hoping that additional effort will make it work
        - The throwing good money after bad money scenario
    - As a result, commitment can restrict the evaluation of information or the choice of alternatives
    - This course of action is particularly likely when evidence of success or failure is unclear.
    - When there is even the faint hope of successes prior commitment will encourage future commitment

- **Common "Rational" Techniques For Policy Analysis**
  - Benefit-Cost analysis
    - See separate notes
  - Forecasting
    - A *forecast* or a *projection* is an estimate of a future event or environmental influence over which the manager of an organization has no direct control.
      - Forecasts enable analysts to form expectations of what will happen to costs or other relevant variables outside of the control of decisionmakers.
      - These techniques are primarily used in long-range planning to analyze potential problems and identify future conditions
      - There is no best strategy, formula, or approach for forecasting a future event. Typically, managers rely on a variety of techniques
      - The usefulness of a forecast is enhanced when analysts give precise definition for the variables of interest
      - Important problem with many forecasting models is the basic assumption that the data used in calculating the models at the beginning of the time period will have the same content as the new data that are acquired in the future
    - Normative forecast
      - Starts in the future
      - Assesses goals, needs. desires, etc. that you will want to have in the future and works backward to specify what should be done to attain them at that future point in time
    - Exploratory forecast
      - Starts in the present
      - Attempts to say what is likely to occur in the future based on today's knowledge and projection of current trends in data.
    - Factors affecting accuracy
      - Nonlinear patterns of change
      - Patterns or relationships may change over time – past does not always project future
      - People/government can influence future events
      - Time horizon for forecasts - Long is less accurate than short
      - Technologic change: The greater the rate of change, the greater the chance that established patterns and relationships will change
    - Some Common Forecasting Techniques
      - Expert forecasting
        - Ask the experts using consensus based methods (Delphi surveys) where answers are summarized and fed back to a group
      - Leading indicators
        - Monitor key events/process/programs/etc. (sub-systems) to predict how broader system will perform
      - Regression analysis/Econometric Models
        - Used to identify and describe the values (independent variables) that influence a dependent variable. Regression finds the linear equation that describes the

relationship between one or more independent variables and their influence on a dependent variable
    - Models may also consist of a series of linear or nonlinear equations involving several interdependent variables. Many times an action (e.g., a tax increase) will have both direct and indirect effects (e.g., an individual's disposable income)
    - Often hard to determine true cause and effect relationships. Statistically significant relationships do not necessarily imply causality
  - Time-Series Analysis
    - Measurement of a variable over time against the benchmark of a standard which was defined when the activity was started. Variables to be tracked might include average processing time for an application, citizen's complaints, crime rates, productivity rates, crime rates, revenue collections
    - Regression line may be used to describe the trend or the line may simply be estimated from a graphic depiction of the data
    - Related to both trend extrapolation and regression/econometric analysis
  - Trend extrapolation
    - Related to regression analysis.
    - It is based on the assumption that the direction and magnitude of change experienced in the past will persist into the future.
    - Assumes we know the shape of the curve (you know the pattern of the relationships
    - While the linear model is the most common, many trends are nonlinear in form. They can also be shaped like arcs (parabolic curves), shaped like the letter j (exponential), and others are shaped like the letter S (logistic). Each of these would lead to a different pattern of decisions
  - Scenario writing
    - A written description of a sequence of events that might occur in the future
    - This method usually proceeds by
      - Studying the facts of a situation
      - Identifying a development, condition, or action which might occur
      - Trying to identify the likely consequences of this action occurring
    - It requires that planners develop descriptions of relevant conditions either a specific point or over time
    - It provides a useful way to examine the details and explore the influences of several variables
  - Descriptive modeling
    - Development of a model of a complex functioning system through observation and estimation of how its components interact
- Simulations & computer modeling
  - Can build models of how a system functions. Many ways to do simulations and use computer models.
    - *Computer simulations* can then be used to explore the effects on a system do to certain actions
      - More than one model can also be developed for a system

        - Simulations can also be used to explore the effects of different management actions (e.g., Total maximum daily loading models, stormwater runoff models, etc.)
    - *Operations research and linear programming techniques* can be used to model systems and select optimum solution sets given identified constraints.
        - Allow for a way to solve problems with multiple goals and constraints
        - Common applications are scheduling models (airline routes, work schedules, etc.)
    - *Role or Game playing* (e.g., war games) can simulate a situation and see how humans respond.
        - Can involve real people played out in real time or computer simulations
        - Often used to prepare for crisis situations (e.g., disaster response, oil spill response, etc.)
        - Useful because it can help participants prepare for a potential situation
        - It can also help to examine the strategies that people may employ in adversarial situations (e.g., war gaming).
- Impact Assessments
    - Environmental Impact Assessments (EIA's)/Environmental Impact Statements (EIS's) are required by the Environmental Policy Act (NEPA) of 1969
        - Examine the problem of unexpected consequences
            - Many federal, state, and local environmental regulations require permit applicants for significant projects to perform some sort of assessment of the environmental impacts of a potential project
        - Various types of impact analysis arose as a reaction to the deficiencies of cost-benefit analysis
            - It allows you to aggregate benefits and impacts and is not constrained by the inability to provide monetary values for costs and benefits
        - EIS typically describes
            - Present conditions
            - Proposed action(s) (including alternatives)
            - Impacts of each alternative
            - Preferred alternative
            - A more detailed description of preferred action(s) and its impacts
            - Steps that will be taken to minimize harm
        - Common aspects of impact statements
            - Direct vs. indirect impacts
                - Direct impacts are immediately related to a project or program
                - Indirect impacts, or secondary or tertiary impacts, are impacts induced by or associated with a project
            - Gross vs. net impact
                - Gross impact is the projected future environment with the proposed project or program
                - Net impact is the gross impact minus the likely future environment without the proposed project or program
            - Impacts can be concentrated or dispersed

        - This raises the question of drawing boundaries for the study
        - It also raises a question of threshold effects -- At what level does an impact become large enough to be considered in an analysis
      - Impacts have duration, which last over time.
        - This raises questions about discounting costs and measuring benefits and costs over time
      - Assumptions
        - Future can be predicted with enough reliability to make it worthwhile to consider potential changes which might be caused by new projects or technologies
        - Policymakers will understand the assessment and respond by modifying the decisions they might have otherwise made
  - Other types of impact assessments
    - Technology assessments
      - Systematic study of effects on society that may occur when a technology is introduced, extended, or modified
    - Social impact assessments
      - Systematic study of the social, economic, and cultural aspects of a proposed project. Often used in international development projects
- Risk Assessment
  - Common tool used to assist in making environmental policy
    - EPA has performed thousands of risk assessments to aid in setting environmental policy
    - Interestingly, risk assessment has grown increasingly controversial even though its popularity and use has grown
    - Risk assessment now engenders the criticisms once reserved only for C/B analysis
    - Lies in that treacherous zone between science and politics
  - It focuses on the probability or likelihood of a harm (e.g., health effects, ecological effects) and its magnitude
    - Should the focus be on health effects or ecological effects?
      - The distinction is important because it forces you to pose different kinds of questions and presents different choices with competing values
    - Severity of the harm is its magnitude or significance (e.g., death, illness, etc.)
      - Acute (immediate) vs. chronic (long-term)
      - Seriousness
      - Reversible?
      - Numbers of people affected
  - How do people perceive risks?
    - People tend to overestimate the risks from unusual, catastrophic, and lesser known sources but underestimate risks associated with common causes
      - EX: people tend to think driving a car is safer than it really is and overestimate the risk of flying
    - Perceptions about risk affect views about what levels of risk are acceptable
      - This leads to a disconnect between scientific analysis and public's perceptions of risk.

- Is perception reality?
- Critics of risk assessment argue that public opinion based on faulty understandings of risk has intimidated decisionmakers into following the wrong environmental priorities
- How does a decisionmaker side with experts when they contradict an aroused and concerned public?

- *De minimus* risk
  - Risks too small or trivial to require a response - below regulatory concern
  - Except in one case, no chemical with a lifetime cancer risk above 1×10^6 was regulated
- *De manifestis* risk
  - Risks so large that any reasonable person would require a regulatory response
  - Every chemical with a lifetime cancer risk above 4×10^3 was regulated
- Problems with risk assessment
  - Main one is uncertainty and necessity for making assumptions that influence analysis
  - Assumptions made early in risk assessment process can influence results by several orders of magnitude
    - Most of assumptions tend to make risk assessments more conservative, that is they overestimate risks
  - Assumptions often have value judgments attached – it is not a technical, value free analysis
  - Many studies rely on animals and use extrapolations to humans
    - To demonstrate with 95% confidence that a certain low-level dose causes less than one cancer case per million subjects would require a mega-mouse experiment involving 6 million mice
    - Most experiments use a relatively small number of animals and then extrapolate the effect on humans from a low-level dose, but this can be off by a factor of 100,000
    - Animals differ significantly in their response to toxins (Dioxin is 5,000 times more toxic to guinea pigs than hamsters)
  - Because of the uncertainty involved, it may make more sense to use it as a rough guide for making decisions and evaluating policy choices rather than as way to make decisions
  - It may not be conservative enough
    - Reductionist perspective may not capture all of possible means of exposure
    - Multiple pathways may drastically increase risk
    - More troubling is the possibility of synergistic affects
      - Risk assessments tend to focus on 1 chemical in isolation from others
      - When combined with other chemicals risks might increase significantly
  - Risk analysis can constrain individual liberty because it does deal with the fact that everyone is willing to accept different levels of risk
    - Who decides what level of risk is “acceptable”?

        - The question of how safe should working conditions be cannot be answered unless everyone has similar preferences with respect to risk and the costs of safety
        - Not a mathematical question but rather one which must be addressed through institutional and political processes
- Long Range Planning
    - There are a variety of long-range planning techniques. These include:
        - Comprehensive land use plans
            - Includes elements of the issues addressed below
        - Watershed/Riverbasin management plans
        - Crisis planning
        - Business planning
        - Economic planning
        - Transportation planning
        - Zoning
    - Some of the characteristics of long-range plans include
        - *Timing*: 5 - 20 years which is usually complemented by a formal amendment process
        - *Purpose*: Thrust is usually to set goals and objectives and make policies or recommendations that will guide future courses of action.
        - *Emphasis*: Developing a legally binding plan in that future decisions should be consistent with the policies contained in the plan. City charter, local ordinances, or state law/regulations determines the legal force of a plan and its policies and recommendations.
        - *Flexibility*: Typically discretion is seen as a problem. It strives to have future decisions be consistent with the plan's policies and recommendations
        - *Methods*: tends to be based on forecasts derived from the extrapolation of current and past trends
    - During a planning initiative any one of a number of forecasting or policy analysis techniques might be used to help planners identify and define problems and to evaluate alternative management actions.
    - Long-range planning can be participatory or nonparticipatory
        - In a participatory effort, advisory committees and the public may have great influence on the content of a plan and may even control or direct the planning process. Collaborative planning is now becoming the dominant paradigm, especially in the environmental and land-use planning areas
        - In a nonparticipatory effort, the development of the plan is guided and directed primarily by an agencies technical staff which then puts the advisory committee and the public in more of a reactive mode. Used primarily in highly technical areas and those which don't gather much public interest or media attention.
- Short Range Planning/Operational Planning Techniques
    - In addition to larger problems and strategic concerns, managers also face a series of smaller tactical or operation problems of making decisions about actions to be taken in the short-term. Examples of typical problems include scheduling of activities
    - Gantt Charts

    - An approach to systematic scheduling. It essentially involves drawing a bar chart that compares work actually being done with the planned objectives and deadlines.
    - It helps to facilitate assigning tasks to individuals.
    - If progress is not satisfactory, it gives managers some idea of where problems are
- Program Evaluation Review Technique (PERT)
    - In PERT, Gantt bars are replaced by a flow-process chart. It is a detailed list of the steps required to complete a process along with a symbolic representation of the sequence of events and an indication of the time required to complete each one
- Critical Path Method (CPM)
    - The CPM employs what is called network analysis. It employs the same general technique of PERT, but in less detail. The analysis is displayed in a diagram using circles, squares, or other symbols to represents steps in the process and lines to illustrate the sequence of activities
    - Circles are called nodes and the lines connecting them are called paths.
    - The diagram is then used to determine the critical path, the longest sequence of paths between the first and last node.
        - Since the critical path is the longest path, any delay along the critical path will delay the entire process
    - Both PERT and CPM can get very complicated. They are primarily analytical planning tools which are most effective when costs are calculated along with time estimates. This can help determine cost overruns or figure out ways to save money
    - Both PERT and CPM are most useful when the project has a very defined sequence of activities (e.g., a construction project)