PLS 308 – Public Administration

Topic: Problem Solving and Policy Analysis

Defining Problems

- Problem definition is a medium through which we discover what we realistically want and how we may go about obtaining it
  - We don't discover a problem "out there" - we make a choice about how we want to formulate a problem
  - Ralph Waldo Emerson noted that we see what our experience has prepared us to see
  - Hemple (1996) "environmental problems are not just naturally revealed, they are – like conceptions of wealth, knowledge, and politics- socially constructed."
- A problem requires a cognitive judgment that the situation is alterable
  - Problems are situations
  - Discrepancy between "what is" and "what ought to be"
  - Not a problem if you can't do anything about it
- Your perspective on a problem is likely to depend on your education, background, training, experiences, etc.
  - This background is also likely to lead you to favor certain policy options. For example, water quality problems may be viewed by:
    - Economists in terms of market failures/incentives/externalities
    - Engineers may see the problem in terms of poor planning and design, technical design flaws, etc.
    - Biologist may focus on impacts to wildlife
    - Educator may view the problem in terms of poor public education
    - Political scientist/public administrator may view it as an institutional design problem
    - Planner may view as a growth management problem
- Big difference between defining policy problems in objective versus subjective terms
  - Most, if not all, policy problems are socially constructed
  - Nature and causes of environmental problems are often defined in ways that yield political advantage for one group over another
  - Selective perception/strategically define problems to lead to predefined policy problems
- Different goals, policies, objectives, and solutions often imply different definitions (interpretations) of a problem or even different problems
- Beware of the type III error
  - The probability of solving the wrong problem

What Can Happen to a Problem?

- It can be *eliminated* entirely by the policy as it is implemented and no other problems emerge
- It can be *reduced* to such a low level that there is no further need or demand for action
- It can be *succeeded* by another problem that has less serious effects or can be solved more easily

- It can be *exacerbated* by the policy and/or replaced by more difficult problems, with still other problems created in addition

Describing a Problem

- Examine the severity of the problem
  - Crisis
    - Emergency vs. non-emergency
  - Novelty
    - Unprecedented vs. familiar
  - Incidence
    - Growing, stable, or declining
    - Social patterns: class, age, cohort, etc.
    - Characteristics of the problem population
  - Proximity
    - Personally relevant vs. general societal concern
- Examine the causes of the problem
  - Intended vs. accidental
  - Blame can/can't be allocated
- Simple vs. complex
- Nature of the solution
  - Available vs. non-existent
  - Acceptable vs. objectionable
  - Affordable vs. Unaffordable

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 planners to form expectations of what will happen to costs or other relevant variables outside of the control of managers.
  - The usefulness of a forecast is enhanced when managers give precise definition for the variables of interest
  - There is no best strategy, formula, or approach for forecasting a future event. Typically, managers rely on a variety of techniques
  - These techniques are primarily used in long-range planning to analyze potential problems and identify future conditions
- 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
- Basic Problem

- 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

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
- 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
  - Can build models of how a system functions. Two ways to do simulations.
    - *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.). It is an operations research technique.
    - *Game playing* (e.g., war games) can simulate a situation and see how humans respond. 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
  - Gets at the problem of unexpected consequences.
  - 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
  - Environmental Impact Assessment (EIA)/Environmental Impact Statement (EIS) which 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

Factors Affecting Forecast Accuracy

- Patterns or relationships may change over time
- People 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

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 charters of legislation often determines the legal force of a plan.
  - *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/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)
- *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

Policy Analysis

- *Policy analysis* can be defined as the systematic investigation of alternative policy options and the gathering and display of evidence for and against each option
  - 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
  - It is an explicit, 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 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 Elements of the 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: it has the same basic elements as the rational decision-making model

Cost-Benefit Analysis

- Cost-benefit analysis is a method for determining the desirability of prospective projects and involves enumeration and valuation in money terms of all relevant costs and benefits no matter when they occur to whom they accrue
- All cost-benefit techniques are generally designed to assist a decisionmaker in choosing among alternative policies or projects. They have the following steps in common
  - Identification of some feasible alternative
  - Prediction of outcomes for each alternative
  - Valuation of outcomes in commensurate units, almost always money
  - Choice of alternative is based on some decision criterion

Key Aspects of Cost-Benefit Analysis

- Direct costs/benefits
  - Closely related to the main objectives of the project
  - Immediate and controllable. Out of pocket costs. Revenue streams resulting from the project. Opportunity costs of the forgone benefits attached to options not chosen. Cost savings from elimination of inefficiencies.
- Indirect costs/benefits (Externalities/Spillovers)
  - By products of the project
  - Intended and unintended opportunity costs and risks. Second order savings and costs resulting from the program/project. Externalities attributable to the project. Multiplier effects.
  - Often more difficult to measure
- Side-Payment exclusions
  - Cost-benefit analysis ignores the transactions associated with programs or projects that involve no net benefit or cost. For example, the sale of land whose value is enhanced or diminished because of a project.
- Marginal Costs
  - Incremental costs incurred as you move from one option (e.g., pollution control technology) to another
- Tangible & intangible costs/benefits
  - Tangible are observable and countable money, goods, and services
  - Intangible consequences of social actions are much more difficult to measure. Examples include changes in public attitudes, air or water quality, reduced or increased risks
- Important questions surrounding a cost-benefit analysis are who actually benefits and who incurs costs
- Time is important. May face costs in the near-term with benefits stretching into the future. Adjust future costs and benefits to present by discounting them.
  - Discount factor adjusts future dollars to current dollars.
  - Present value = Future value/$(1 + r)^n$ where r = discount rate; n = time period

- Decision Rules. Need a rule for selecting among alternatives or deciding whether to proceed. two common rules are:
  - Greatest net benefit = B - C
  - B/C ratio > 1 (efficiency)
  - Example: Army Corps of Engineers Dredging Project
- Utilitarian calculation. Concerned only with efficiency.
  - Not concerned about other possible goals like equity and democratic accountability which may be associated with the long-term impacts of the proposed action

Offshoots of the Cost-Benefit Approach

- Cost effectiveness analysis
  - Truncated version of benefit/cost analysis. It looks at how cost effective a management action is. Generally used when policy goal has already been decided
- Economic Impact analysis
  - Purpose is to predict the economic impact of proposed management actions of governments, firms, economic sectors, or the economy as a whole

Criticisms of Cost-Benefit Analysis

- Difficulties in attaching values to quantified costs (e.g., aesthetic impacts)
- The question of who bears the costs and who benefits is not addressed
  - C/B problem doesn't deal with redistributional equity
- The problem of aggregation
  - There are practical and theoretical difficulties associated with value weighting and summing of several measures in an analysis to give an overall composite figure
  - Conventional CBA can make any proposition incomprehensible by misguided quantification and faulty aggregation which attempts to add together disparate factors in a problem like noise, pollution, travel time, capital cost, etc.
- How are compliance costs going to be measured
- Choice of a discount factor can change the results
- Costs may exceed benefits but action is still warranted
- How to account for opportunity costs
  - You do not question the objectives. You can determine the lowest cost solution to combined sewer overflow remediation techniques but can't question whether money is better spend on NPS pollution runoff