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## Environmental Planning

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## Environmental Planning

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## ENVIRONMENTAL PLANNING

Steve Konkel, Ph.D.

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## OBJECTIVES

- Define planning in operational terms, as it is practiced by planners.
- Understand why we need to establish baselines in environmental health for sound planning.
- Understand examples of problems encountered in solid waste management and in developing a vector control program.
- Identify why trends in globalization and communication technology increasingly affect environmental planning.
- Discuss the limitations of environmental laws due to the lack of an integrating environmental statute.
- List the ten steps that make up a planning process and explain how these planning steps can also be consolidated into six major elements.
- Discuss potential human health impacts from inadequate planning and the lack of infrastructure.
- Discuss how haphazard growth creates resource allocation problems
- Understand why identifying values, interests, and expectations (VIE) is essential to strategic planning and key to understanding interested party, or "stakeholder," views and positions.
- Understand why environmental policy, programs, procedures, and rules and regulations are all essential to environmental regulation and management.
- Understand why identifying agency roles, responsibilities, and jurisdictional boundaries are essential to creating effective governmental agency and consultant performance.
- Develop approaches incorporating sound scientific and technical information.
- Identify alternatives to litigation for conflict resolution in environmental health decision making.
- Identify the roles risk analysis plays in prioritizing goals and budgets.
- Explain how risk management measures can assist in development of a preventative approach, rather than a treatment approach, to environmental health.



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## INTRODUCTION

There are three essential components of all planning and these are as follows:

1. *Where you are now.* It is essential that you know where you are now in regard to the subject that you are planning. This is one of the most frequent mistakes made in the development of plans. Knowledge of present conditions and challenges in regard to the plan are essential to justifying the funds appropriated to the program for which the plan has been implemented. Food inspection programs amply demonstrate this point. Federal, state, and local authorities carry out complex programs. Few would argue that such programs are essential, since they pay for themselves many times over. However, since baseline data do not exist to mark where we started, and the major successes are in prevention of the wide variety of diseases discussed in Chapter 11, environmental health professionals cannot effectively provide the taxpayer with the overall benefits derived from these programs.
2. *Where you want to be.* This process is defined as the **vision** in strategic planning or as the desired outcome in planning environmental health and other programs.
3. *Charting a path to get from where you are now to where you want to be.* This part of the planning and **implementation** process involves linking an organization's values and vision through **assessments** of its strengths, weaknesses, opportunities, threats, and the design of strategies to address the key issues facing the organization. This complex but linear process is described in detail in "Participatory Planning" (Beck and Konkel, 1999). It is important to involve *all* constituencies with "stakes" in the outcome, in order to establish ownership and accountability for the plan. Recent events reinforce the observation that "It takes many people to build a bridge, but only a few to destroy it."

Our understanding of the importance of healthy ecosystems and the impact of people on the natural and the built environment continues to grow. The need for **stewardship** to preserve, protect, and enhance the natural environment and promote healthy populations is increasingly seen as a universal responsibility of environmental health and safety (EHS) professionals. At the same time, we have seen an unprecedented growth and sophistication in technology, from semiconductors and aircraft engines to emerging biotechnology products, pharmaceuticals, and health care technologies. Technological developments affect the food we eat, how we communicate, how we work and play, and our quality of life.

Despite technological advances, we face the dilemma of earlier civilizations:

- "How do we create a sustainable and high quality of life given an ever-growing population?"
- How do we regulate economic activity in order to achieve profitability while reducing adverse impact and enhancing environmental stewardship?

In the environmental health field our colleagues and the general public constantly struggle with acquiring the resources to implement environmental health policies, programs, and projects that will make us better off. As taxpayers, we often seek efficient and equitable solutions to the wide array of problems we encounter. As professionals we must increasingly compete for limited funds aimed at improving the health status of populations and efficiency of industrial operations. The author argues herein that sound planning is essential if we are to accomplish our shared environmental health goals. Many accepted societal goals are listed in a "big-picture" planning guidance document titled "Healthy People 2010" (see "An Example of a Planning Framework—Healthy People 2010" herein).

In this opening section of the Environmental Planning chapter, key planning terms are defined. The author also takes seriously the charge of EHS professionals: to make a difference in people's lives today and to achieve a brighter future. We

must be willing to balance various factors and harness the power of science and technology. In the long run education may be the key to helping people make the small choices that add up to improvements in environmental quality. We trust that this book helps students take the first steps. As the recent bioterrorism events amply demonstrate, not planning is simply not an option. We need to solve the right problems in a way that works. Unfortunately, September 11, 2001 is a day marked in infamy; its events and the loss of lives remind us across the globe of the importance of managing risks and making investments to preserve the freedoms and way of life that we enjoy.

**Environmental planning** provides tools and mechanisms to better understand ourselves and the individual and collective choices we have. We all play a role in developing the physical and social fabric of communities. Risk analysis and managing risky decisions help us identify risk factors, draw priorities, and allocate resources. In addressing risky decisions, we need to use sound science and technical information. We need to assess alternatives and find ways to mitigate or avoid adverse consequences of development. We need to find constructive ways to manage conflict, rather than a "winner takes all" approach. The alternative of neglecting to plan or identifying appropriate risks often leads to unanticipated and undesirable health outcomes, poor use of resources, and a waste of time and energy.

In this chapter there is an underlying premise that most individuals plan. Environmental planning has to do with the advance thinking that we do that relates to the built and natural environment, the presence of nature and wildlife, and promoting human health and welfare. In today's specialized work world, it is not enough to know how to plan projects to be on time, on budget, and to specifications. One also has to be able to acquire scientific knowledge and technical expertise as needed—a new requirement for "technological literacy." So, for example, a biotechnology planner would have to understand the impact of pesticides on the environment, and how altering the genetic makeup of plants might impact the soil, insects, and flora and fauna. Using pesticides or pharmaceuticals on the farm can leave residual levels of chemicals in the

products, from grains to chickens, and there is much controversy today regarding consumer fears about the potential effects of consuming these genetically altered plants and animals on humans. How we resolve these issues will govern the food quality we enjoy and count on for human sustenance. There will also be profound affects on the world we live in, as economic activity and environmental impacts result from these choices.

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## THE NEED FOR PLANNING

Primitive people did little, if any, planning. They reacted to events, rather than acting proactively and thinking reflectively about their experiences. If it rained, then they found shelter. If they were hungry, they hunted for food. Later, early humans planned for rain by building shelters. They planted gardens and cultivated crops in order to supplement and eventually to largely supplant hunting for subsistence. They learned ways to preserve food and make it safe for human consumption. Native Alaskans still depend on "living off the land" through **subsistence** activity. Modern communities are constantly evolving, learning to use new communication and transportation technologies, such as hand-held global positioning systems and the latest jet airplanes, while also importing traditions and ways from other cultures. These developments guide planners in understanding the importance of values in seeking improvements in the health and quality of life of populations.

Early civilizations did not plan environmental programs. Their needs were often met in a much more spontaneous manner. They did not plan water supply and water treatment programs, sewage disposal programs, nor their housing. Often they were mobile and moved according to the seasons and the productivity of hunting grounds. They often reacted to immediate needs. Even in places that were heavily impacted by migration and industrialization, environmental health gains did not come easy, nor were health hazards always recognized as they are today.

Places like London, England, attracted new urban residents seeking jobs and more money than was available in rural areas dependent on farming.



Although rural workers realized opportunities associated with migration, the urban places that they moved to were often unable to accommodate their needs for housing, clean water, sewage systems, and other necessities. This often led to poor living conditions, especially in urbanizing areas where large populations settled. Action was taken only after outbreaks of disease, epidemics, suffering, and death. For example, early 19th century Liverpool, England, had little, if any, planning. There was no planning for water supply, sewers, housing, smoke control, or occupational health; there was no city planning either. Statistics reflect starkly the seriousness of these oversights. In Liverpool the life expectancy for the wealthy in the early 1840s was a mere 36 years old, as cited in Edwin Chadwick's 1842 report, "A Report on the Sanitary Condition of the Laboring Population of Great Britain and on the Means of Its Improvement." Chadwick also estimated 22 years life expectancy for the middle class and a mere 16 years for the laboring classes. It is insightful to view health and disease in places like London over the period from 1750 to the present (see Rotberg et al., 2000). Edwin Chadwick effectively documented one of the primary results of haphazard growth and crowding—a lack of proper planning for infrastructure and its related impacts on the health and life span of urban residents.

In the United States we tend to take clean water, sewage disposal, clean air, and many other amenities for granted today. However, there are many areas of the country where we have aging or inadequate infrastructure, such as leaking water supply aqueducts, and sewage treatment plants that cannot fully treat human waste, especially when they become overloaded with **combined sewer overflows (CSOs)**. Aquifers and wells have been contaminated, community water supplies have been lost, and we still have places where human waste is sent via "straight pipes" directly into streams without sufficient treatment. Urbanization and the need for planning are linked, but rural residents also benefit from planning.

Environmental planning evolved because of epidemics, or, in other words, disease arising from the environmental conditions of overcrowding, particularly in major cities. Planning is needed for orderly, healthy, and economic social growth.

Amenities like libraries and the urban design created by scores of individual structures affect our community livability, just as investments in clean water and safe food supplies improve our health and well-being. Urban planners concern themselves with how transportation systems, buildings, land uses, and natural amenities combine to create a high quality of life in cities and population centers. An urban designer or planner is to city architecture and cultural experiences what an architect is to an individual building: a system thinker focused on physical, environmental, and sociocultural factors affecting how civilization works. *Rural by Design* (Brabec et al., 1994) and articles on the new urbanism (e.g., Lockwood, 2001) explore solutions for the commonly identified problem of urban sprawl.

The benefits of planning are obvious everywhere in the country. Farmers plan their crops; business people plan their marketing and sales; architects plan buildings; and politicians plan their campaigns. Investment counselors plan for investments; health planners plan health programs; dentists plan corrective measures for dental health; and students plan curricula and careers. Civic groups engage in planning for civic activity; doctors plan courses for patient recovery; lawyers plan their advocacy for cases and achieving justice through the legal system. Everyone plans, but many may not see it as a formal activity, as well as an "art form." Good planners consider uncertainties and make contingency plans. The alternative to planning is really an acceptance of the "no action" or let's see approach; it by definition is planning because it endorses the existing value structure and results, which may not hold up to future scrutiny. Wise decisions usually incorporate sound scientific and technical information.

We all plan budgets, trips, weekends, weddings, vacations, and family activities. Many advocate that a great need in the 21st century is for family planning, and the author is certainly in agreement with those who see profound impacts over time of increased human populations on social, economic, and natural environments.

While planning is a part of our daily lives, good or bad environmental planning can greatly affect the quality of our entire lives. Good planning utilizes systems thinking—so, for example, land

uses reflect decisions regarding emergency services, transportation, housing, natural systems, infrastructure, and the impacts of development on people. Peoples' quality of life is determined by the interaction of all of these factors and the myriad of decisions with environmental implications made by individuals, organizations, and agencies. Haphazard, unplanned growth is often the product of decisions of individuals who do not account for the cumulative impact of these decisions on the welfare of the community as a whole. Traffic gridlock is just one manifestation of the lack of proper attention to infrastructure planning, design, funding, program development, and implementation. Failure to plan can be seen as planning to fail. Inadequate plans carry social/individual costs.

## DEFINITIONS AND TYPES OF PLANNING

**Planning** is defined as organizing a way of getting from here to there, or where we are now and where we want to go. It is a means to ends. In developing hundreds of strategic plans for organizations and agencies, we first explore values and create a vision for the future—then we assess where we are now, and chart a path to the future (Beck and Konkel, 1999). This avoids "parachuting into a minefield and deciding where to take the first step." This is one of the most common mistakes people make when planning. Developing a course of action is the essence of the process of making and carrying out plans. Good planners identify and navigate obstacles; they are politically aware and astute communicators. Planners develop goals, policies, and procedures for a social or economic or governmental unit; for example, a church, a business, or an environmental protection or transportation agency of state or federal government.

A **goal** may be defined as "the end towards which the effort is directed." We all have a goal of wanting to earn a sufficient amount of money to assist in having a good quality of life. To some, a good quality of life can be achieved by owning a few acres, with a house, fish pond, cat, dog, horse, spouse, and children. To others, a good quality of life means owning several cars, TV sets, a house,

boat, business, and other material goods. Regardless of how we define quality of life, we realize that none of us can reach this goal without good health in an environment that supports the pursuit of life, human liberty, and happiness. Life is about the journey, and not a destination. Goals help set the direction and the intensity of the journey.

In **strategic planning**, a distinction is usually made between the strategic plan (the fabric of which contains a vision, mission statement, goals, and an outline of strategies) and program or **tactical planning**. The latter entails defining milestones, designates who will do what and when, and how the accomplishments of tasks contributes to achievement of goals (Beck and Konkel, 1999). Another point concerning the "language" that planners use is important here: some consider goals to be targets that can be reset to higher levels, whereas **objectives** are usually considered by planners and public administrators to be "measurable." Some business texts reverse this distinction, considering "objectives" equivalent to goals and making goals the measurable, operational part of implementation. The overall goal of a recreation program is to maintain or improve health, while individual objectives may be to reduce disease, to augment health by increasing exercise, and to reduce the number of accidental injuries, which originate in recreational areas.

A **policy** can be defined as "a plan of action, guidelines, or a managerial tool for identifying and setting expectations given resource assets and limitations." It would be poor policy to promote what you cannot accomplish. A sound energy policy should balance the need for electricity generation and fuel production, such as natural gas and oil, with implementing conservation and efficiency programs. One should explicitly consider the impacts of development of energy supplies on the natural environment, pollution, human health implications, and the effect on social and economic systems. Sound complex? No wonder this has proven to be a controversial and challenging charge!

A **policywonk** is an individual who, by studying, assessing, evaluating, and making recommendations on policies, has a key practical role in the public policy arena. This term, which was invented by analysts and those interested in governmental



policies, acknowledges that one must follow issues to understand the implications of alternative courses of action.

A **procedure** is a way of going forward, a way or method of doing things. For example, the procedure for starting a car is to get in, turn the ignition on, put the car into gear for forward or backward motion, and steer as one drives the vehicle.

There are multiple types of planning that are extremely relevant to environmental specialists and environmental health professionals. Selected types of these are noted below:

- **Project planning** has been widely used over the years. A good example is Boulder Dam in Colorado, which generates electricity. Complexity of planning varies greatly. For example, planning and sizing an air duct system for the heating, ventilating, and air-conditioning system in a house is only a portion of house design and building. Another example of project planning is planning for orbiting satellites for communications purposes. This planning involves physics, chemistry, geography, geology, engineering, astronomy, and economics. Project planning for buildings addresses site-specific impacts, as well as financial, economic, timing, scheduling, and user requirements.
- **Comprehensive planning** is a term that has different connotations. On a personal level, it describes the ultimate state in a person's endeavor to perform, a major achievement that shapes the environment or one's future. For a city and its surrounding region, it aims to integrate various natural and socioeconomic systems to produce a pleasing quality of life. **Zoning**, a means of designating allowable land uses (residential, commercial, and industrial, and their intensity, e.g., single-family versus up to six apartment units) is often used as a means of implementing policies and procedures in accordance with a comprehensive plan. This planning helps guide decisions on expanding infrastructure, such as water, sewers, and electricity.
- **Urban planning** is the planning of human habitats, reinforcing positive linkages and rela-

tionships with natural systems while minimizing constraints from pollution and other environmental factors. The relationship of individual buildings, infrastructure, and sociocultural systems is the challenge of the architect, planners, and developers tackling urban design issues. Faneuil Hall, on the Boston waterfront, is a development created by James Rouse's Baltimore-based company that demonstrates a successful waterfront development concept of mixed land uses by design of a pedestrian-oriented environment with cafes, street theater, and open-air markets.

- **Public health planning** usually is seen as including three arenas: environmental health, community health, and personal health promotion, including mental health. How bioterrorism and other developments like the hole in the ozone layer affect public health are pushing the boundaries of this **paradigm**, or "mental model." Health planners plot courses of action to protect, promote, and enhance people's health. Healthy People 2000 and Healthy People 2010 are examples of the efforts of diverse coalitions to chart the goals and a viable path.
- **Environmental health planning** is planning a course of action to protect, promote, and preserve people's health by envisioning, designing, and implementing programs to control environmental factors. These factors are identified, and authors suggest various means for preservation, conservation, prevention, management, and control of them, in individual chapters of this book. **Program planning** must identify the values, interests, and expectations of various interested parties who want to have a say in the role and authority of governmental agencies in setting policy and implementing regulations.

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## THE PLANNING PROCESS

Historically, environmental planners have had to deal with challenges such as which agency has jurisdiction over a particular issue or permitting situation,

the multimedia nature of **pollution** (air, land, and water), and fragmented efforts of various stakeholders or interested parties to maximize their interests. Environmental planning has been piecemeal, since, for example, using scrubbers to remove sulfur from coal air emissions then creates ash, which has to be properly managed. The environment should be planned as a series of systems whenever possible, rather than as categorical areas. Pollution prevention is an example of an area where planning industrial processes avoids environmental releases of toxic materials and the associated cleanup and health effects liability. Another example is climate, a system that affects us all. The climate determines whether land is suitable for crops grown for food, cotton, tobacco, and so on, and thus can support the demands of human populations. The climate also determines if disease-producing insects, such as flies and mosquitoes, will inhabit an area, as many times in the past flies and mosquitoes have influenced human habitation. Hence, climate is a factor to be considered in environmental health planning. Other environmental factors that affect the environmental health of populations include terrain, rainfall, wildlife, transportation, and sociocultural characteristics of populations. The latter include religion, age, gender, family structure, ethnic background, and socioeconomic level.

### Ten-Step Planning Process

The planning process consists of ten steps:

1. Identify the problem.
2. Analysis.
3. Set goals (targets, outcomes).
4. Set objectives.
5. Develop alternative solutions.
6. Test alternatives.
7. Make modifications to mitigate adverse consequences and promote positive aspects of the plan.
8. Select the best solution.
9. Implement the plan (sometimes called tactical planning).
10. Conduct **program evaluation**—measuring progress towards goals and objectives.

Another approach to planning consolidates these into just six steps.

### Six-Step Method of Planning

1. Examine the situation and its "context."<sup>1</sup>
2. Set goals, or targets.
3. Set measurable objectives
4. Design the program.<sup>2</sup>
5. Implement the program.
6. Conduct program evaluation.

### Examine the Situation and Its "Context"

Before developing a new environmental health program or modifying an ongoing one, it is necessary to get a complete picture of the situation. One needs to know the size, nature, and context of the problem. A planner needs information concerning planned activities for public and environmental health problem areas, available physical and human resources, and information about the population being served. Successful planners also require information about an area's geography, weather, and man-made features (infrastructure such as water and sewer lines, highways, electricity and energy sources, as well as housing, proximate land uses, and industrial plants). **Geographic information systems**, also known as GIS, are increasingly used to organize and map massive amounts of data, which can be layered or overlaid to yield insight into how cities and regions work. Planners often benefit from proactive strategies to involve the public in the development of values, mission statements, visioning, and goal setting (see Beck and Konkel, 1999). Various agencies have data and analyses relevant to the information needs of planners. Developing current conditions (a baseline) and evaluating trends and uncertainties to make forecasts is part of the "art" in the planning profession.

<sup>1</sup>(1) **Examine the situation and its "context"** combines steps (1) and (2) from the ten-step process.

<sup>2</sup>(4) **Design the program** incorporates steps (5) Develop alternative solutions, (6) Test alternatives, (7) Make modifications to mitigate adverse consequences and promote positive aspects of the plan, and (8) Selecting the best solution from the ten-step process.



There are numerous examples of development issues that affect public health and welfare. For example, in Kentucky, there are currently many proposals to develop coal-fired power plants to supplement electricity supplies. Whereas the environmental health and impacts on air, land, and water are primarily local and regional impacts, the mining and burning of coal increasingly takes place in a regional context, where electricity can be moved across state lines. In fact, **electricity deregulation** policies often mandate not only access to an electricity grid, but also sharing the burdens of upgrades. Policies for deregulation of electricity in states like California can affect prices paid for coal and prices paid for electricity in other regions and at other locations. Bond prices in New York can affect prices paid for reclamation bonds in Kentucky. **Spot prices**, prices paid for delivery of a good on a short-term basis, may be driven by changes in prices for related commodities. Project developers need to pay attention to these types of linkages. We are increasingly affected by developments outside our local counties, in other parts of the state, in other states, in Canada and Mexico, and even globally.

### Set Goals

A clear statement of goals is essential to the development of a program. Goals should be broad targets and not be “beyond the pale.” Sometimes when goals are attained earlier than expected then they are set at even higher levels.

### Set Objectives

Objectives should be clearly stated and measurable. Some professions tend to have objectives as the “higher order” and goals as means of meeting the objectives. Though this convention can be confusing, it can work if it is used with consistency. If one sets a personal goal of receiving a master’s degree in public health, specializing in environmental health, objectives could include taking the courses in the curriculum, obtaining and excelling in work internships with various employers, and finding a great job once one attains the degree. This does not preclude resetting the goal to add more diverse work experience, undertaking a

Ph.D. degree, obtaining more training, or setting new professional goals.

### Design the Program

In this step, the planner should brainstorm, create, and mold an integrated set of activities, procedures, and resources that make attainment of the goals and objectives possible. This may result in a completely new program, or a modified version of an existing program. The program should be described in detail, with its requirements—including such elements as full-time equivalents (FTEs) of labor, money, facilities, and equipment.

### Implement the Program

In this phase, the planned program is put into action. This means committing the necessary materials, equipment, personnel, and technology. Shortages of materials, changes in requirements previously specified, lack of equipment, unqualified personnel, and unavailability of technology often challenge a planner in this phase. Sometimes general economic conditions change the premises upon which estimates were made, so inflation or recession in the economy may limit what can be done without additional project resources.

### Evaluate the Program

Evaluations of what is expected and deviations in plans can lead to adjustments. These may be able to compensate for situation changes, poor assumptions, estimate errors, inflation, and unanticipated changes in program operations. Every year or two it is wise for planners to reconsider the problem for which the program was planned. Continuous monitoring is an asset for a successful program. It is useful to design alternative approaches to assist in meeting overall goals. Evaluation involves measurement of progress toward the goals and objectives identified for the program. Planning is a dynamic rather than a static process. In many cases it is art as well as science, an ability to deliver on time, on budget, and to specifications the desired programmatic results.

## STYLES OF REGULATION

### Collaborative Planning in the Regulatory Environment

The federal Environmental Protection Agency (EPA) and the Occupational Health and Safety Administration (OSHA) need strategic plans, policies, and programs to avoid the polarization with industry and common public perceptions as always being painted as the “bad guys,” enforcing regulations against “bad actors.” OSHA has developed a **Voluntary Protection Program (VPP)** in which the agency assists companies in identifying and correcting problems without the traditional inspection, violation, fines, and negotiation parts of the cycle. The National Academy of Public Administrators (NAPA, 1995; also see Appendix 1) has criticized the federal EPA for the way it has set priorities and

### CASE STUDY I—SOLID WASTE

Now that we have discussed the planning process, let’s look at a hypothetical example.

#### The Solid Waste Situation in a County

In a rural county in a mountainous state, one-half of the county is not served by solid waste collection. Houses are located on average one-fourth of a mile apart in an area predominantly used for farming. Since it is not economically feasible for the poor county to provide house-to-house solid waste collection, the waste often finds its way into streams and into open pit dumps throughout the area. The improperly disposed waste serves as a breeding place for rats, roaches, flies, and other insects. In addition, the county and residents are degrading the environment by polluting the water, land, and air, and open pit burning and backyard incineration of the refuse is commonplace.

The state has recognized that the improper disposal of food, household trash, paint, and other wastes has possible impact on the health of communities, to say nothing of the tourism dollars lost because of unsightly, illegal dumps. The legislature and the governor have been debating the issue of what to do statewide. Currently there is controversy and gridlock in the senate over whether to put a container deposit on certain beverages, and how to pay for cleanup of illegal dumps. Some federal grants may be available for cleaning up the worst of the trash dumps. Without new legislation or container deposits,

the results it has achieved given its mission and resources. This may be changing. For example, the EPA is working with 27 companies to test or develop innovative management strategies in order to achieve better results than what would be achieved under current law in “**Project XL.**” In rulemaking, a multimedia environmental rule that the EPA recently issued for the pulp and paper industry allows companies to delay compliance with more stringent water pollution control requirements if they commit to installing more advanced technologies.

Another example of the EPA working with industry to solve environmental pollution problems is the Common Sense Initiative, which aims at cutting toxic emissions 75% compared to 1992. In the metal-finishing industry, firms obtain regulatory relief and other benefits in exchange for going beyond compliance. This affects 11,000 metal-finishing shops nationwide.

however, it is expected that the problem of illegal dumps will continue to plague the Commonwealth.

#### The Goal

The goal for the program is to protect and enhance the health and welfare of community residents by collecting and properly disposing of solid waste in order to reduce insect and other vector-borne disease, while improving environmental and ecological conditions in a cost-effective manner.

#### Objectives

- To reduce diseases spread by insects and rodents.
- To enhance environmental and ecological conditions by removing open dumps (which are illegal); and to discourage creation of new ones.
- To reduce the amount of waste that finds its way into streams.
- To reduce air pollution by stopping the burning of trash by individual homeowners.
- To reduce litter and the blight of illegal dumps.
- To reduce stream and groundwater pollution.
- To provide an economical system for homeowners to dispose of their trash.

#### The Program

The distance between houses makes it economically infeasible to provide house-to-house collection, as mentioned



earlier. Therefore providing refuse receptacles, the “green box” method of utilizing a central receiving area, is the method of choice selected by the county planner. At central locations in the rural parts of the county, the county, using its local property tax receipts for funds, will provide 20 cubic yard bulk refuse receptacles. In the event that this source of revenue is “tapped out,” a small assessment (\$ per thousand dollars assessed value for land and improvements) may be added to the local taxes. This is a decision that must be made by the local decision maker; in this case, the judge executive makes the decision.

The planner has done some checking with other municipalities and engineers in surrounding jurisdictions and has determined that the county should provide five locations for the green box refuse receptacles according to population and other factors. Citizens will bring their refuse and dump it into the containers. The county has also evaluated whether these areas can also be used to collect recyclable materials presorted by residents, such as newspaper, cans, and clear and colored glass. Buyers have been found for the recyclables. The county will collect and dispose of the refuse from the central sites twice a week and hire two people to monitor the five storage areas as well as purchase a front loader compactor-type collection truck to collect the refuse and transport it to the county sanitary landfill.

### Implementation

The county will hire two people to monitor the five receiving sites and will build a shelter at each site to be used in monitoring activities. The county will purchase a garbage truck and will hire the driver. The county will purchase the bulk refuse receptacles and will place them at the five sites along with the recyclable collection bins. Community residents will bring their refuse to the five sites. Trucks will transport the waste to the county landfill.

### Program Evaluation

The program can be evaluated by the following:

- Determining the reduction of waste in streams and associated benefits of improved water quality.
- Determining the reduction of waste in open dumps.
- Determining the reduction of waste treated in backyard incinerators, and the associated environmental burden on air quality.
- Determining the improvements in the general appearance of the areas of the county newly served by solid waste disposal services.
- Determining the reduction of rats and insects and the prevalence of the diseases that they spread.

## CASE STUDY II—TICK-BORNE TYPHUS

The control of tick-borne typhus (formerly Rocky Mountain Spotted Fever) is another good example for planning programs with environmental health benefits.

### The Situation

Tick-borne typhus is a disease that was first a problem in the Rocky Mountains, but now is a threat to the majority of the United States. In recent years it has been of much concern in the Appalachian Mountains, particularly in the southern parts. The wood tick, borne by dogs and other like animals, spreads the disease. It is caused by a rickettsial organism. Since the organism can be transovarially transmitted from the mother to the offspring, it is more of a threat than other tick and insect-borne diseases. In many related diseases, the vector must bite a host that possesses the causative agent before it can spread the disease. However, tick-borne typhus needs no such agent, only vector and victim. Since tick-borne typhus can be transovarially transmitted and because ticks are difficult to control (it is not possible to spray the total country to eradicate ticks), it is therefore a greater threat than

malaria, for example, where we can drain water bodies and standing pools, and use chemicals and fish to kill the larvae and pupa. Since it is also a threat to farmers, hunters, campers, and anyone who walks outdoors in grass, weeds, and woods, health departments should have a planned program for preventing tick-borne typhus.

### The Goal

The goal is to enhance the public’s health by reducing their chances of suffering or dying from tick-borne typhus.

### The Objectives

The objectives are the following:

- To prevent loss of time from work.
- To prevent the need to spend money for medical care.
- To prevent the risk of dying from tick-borne typhus.
- To prevent people from having to curb hiking, camping, and other outdoor activities that enhance their health.
- To reduce the chance of tick paralysis.

### The Program

Since it is impractical to spray the countryside to control the tick, other measures must be utilized. The program has to be one of reducing the chances of human exposure to ticks. This can be accomplished by reducing hiking, camping activities, and other outdoor activities, that is, sports that are played on grass. But it is impractical to expect farmers, ranchers, gardeners, game wardens, and so on, to reduce their outside activities and it is not desirable to stop hiking and camping. It is also not feasible to immunize the total population.

Areas often used for outdoor sports should be surveyed for the prevalence of ticks. This can be done by pulling a cloth (sheet or similar-sized item) over a designated area. The ticks have a means of sensing heat (a warm-blooded animal and a new blood meal), thus as it is pulled along by a person, the tick latches onto the sheet as well as the clothes of the person pulling the cloth. Tick counts are made by simply turning the cloth over and counting the ticks in order to calculate the number of ticks per acre. This prevalence number can be used to determine if, after the survey, an area can be deemed suitable for outdoor activities. If the number of ticks is extremely high, the area may be sprayed.

Educating the public is necessary for reducing the cases of tick-borne typhus. Environmentalists working with the health educators in the health department and the members of the public health team should develop a program for educating the public. The risk communication messages should be broadcast through newspapers, television (e.g., “Kentucky Outdoors”), magazines (“Field and Stream,” “Hunter’s World”) radio, and other means. The profiles of the tick-borne disease should describe how tick-borne typhus spreads, and how to prevent it, that is, socks over pants, shirt tails tucked in, tight

## AN EXAMPLE OF A PLANNING FRAMEWORK—HEALTHY PEOPLE 2010

One of the challenges in public health has been to develop environmental health objectives. In order to meld environmental health programs and policies with associated objectives in public health as a whole, it is advantageous to take a look at “big-picture” issues and approaches. The Department of Health and Human Services (DHHS) has sponsored such an initiative, known as **Healthy People 2000**. There were earlier versions as well. This framework was updated (January 2000)—with the new edition known as **Healthy People**

cuffs, use of repellent, avoiding areas that surveys determine as having excessive numbers of ticks. The public should become aware of the need and procedure for detecting ticks after outdoor activities. Information concerning “hot spots” should be made available to the public by utilizing the news media as well as flyers and posting areas. The public should become aware of the times of the year when the ticks are most prevalent and present the greatest risk.

### Implementation

The program should be implemented in the spring when the tick becomes active and when people start their outdoor activities. The implementation would include the following:

- Conduct tick surveys two weeks before activities to enhance options for controls.
- Spray camping, hiking, and playground areas periodically if they are highly infested.
- Prepare and release material for educating the general public, scout troops, and recreational area personnel (such as those who run state parks and local park facilities) on how to properly remove ticks. This can be done by cutting off the oxygen supply by completely covering the tick with cooking oil.

### Program Evaluation

The program can be evaluated by doing the following:

- Assessing the reduction in the number of cases of tick-borne typhus through effective surveillance programs.
- Determining the reduction by repeating the survey procedure after spraying.

**2010** representing both a planning process to set up a framework for planning as well as an evaluation process to measure success or progress toward goals.

The Healthy People 2000 Framework set national goals, which were developed to reduce premature mortality and preventable disease. Measurable objectives were developed to reduce lead poisoning, cardiovascular disease, asthma, diabetes, blood lead levels; the list is extensive and enlightening (Healthy People 2000, 1970). In this initiative there were 17 environmental health objectives, and environmental health was cast in a bigger picture view of environmental quality.



## Healthy People 2010

The process of planning for preventing and controlling environmentally caused diseases has three distinct elements: establishing goals and objectives, programming, and continuous assessment.

Healthy People 2010 contains a set of health objectives for the nation to achieve over the first decade of the new century. It can be used by many different people, states, communities, professional organizations, and others to help them develop programs to improve health.

Healthy People 2010 builds on initiatives pursued over the past three decades. The 1979 Surgeon General's Report, Healthy People, and Healthy People 2000 both established national health objectives and served as the basis for the development of state and community plans. Like its predecessors, Healthy People 2010 was developed through a broad consultation process, built on the best scientific knowledge, and designed to measure programs over time.

## Additional Examples of EPA Collaborative Approaches

The **33/50 program** set ambitious goals to reduce toxic emissions 33% and 50% by 1992 and 1995, respectively. EPA recognized over 40 companies for their results.

A voluntary agreement between the EPA and car manufacturers is focused on offering less polluting vehicles in the northeast region of the United States and the District of Columbia for 2001 model year vehicles. Pollution reduction of up to 70% of previous emissions is one of the goals.

The EPA is also supporting cleanup of community "**brownfields**"—sites that can be (and are often) overlooked for development or redevelopment because of the presence of contamination and its associated liability. EPA has funded cleanup and restoration seed grants amounting to \$24 million, provided technical assistance to 121 communities, and supported new tax incentives, which are estimated to have led to \$300 million in investment and affected more than 5,000 communities. Reuse of these sites will reduce the real estate pressure on open space and "**greenfield**" areas—areas that are more rural in character and often require extensive investments in utilities and site access.

## Healthy People 2010 Overarching Goals

### Goal 1: Increase Quality and Years of Healthy Life

The first goal of Healthy People 2010 is to help individuals of all ages increase life expectancy and improve their quality of life.

### Goal 2: Eliminate Health Disparities

The second goal of Healthy People 2010 is to eliminate health disparities among different segments of the population. The segments of the population include: the indigent, racial minorities, children, and the elderly.

The Environmental Quality section indicators relevant to Environmental Health include 30 objectives relating to exposure media such as air, soil, and water. These issues are addressed through health promotion, health protection and preventive services, including environmental risk reduction programs. This area is one of the 10 leading Health Indicators for Healthy People 2010.

Although the EPA has offered more compliance assistance to industries affected by its rules and regulations, EPA also collected the largest fines (dollar amount) ever in 1997. EPA is attempting to move toward good faith efforts toward finding, disclosing, and fixing environmental problems. During 1997, 247 companies reported violations at more than 760 facilities. Clearly there is an enormous amount of work to do to improve the effectiveness and efficiency of protecting the environment and human health.

Time will tell if the initiatives profiled above will emerge as a catalyst in changing our "regulatory culture" in the United States. Clearly, not all nations have the legal and political approach to "**command-and-control**" regulation that we have adopted in the United States. International comparative studies bear this out (e.g., Vogel, 1986). It pays to have a more global than local perspective on developments in the regulatory arena because economic systems are interrelated. For example, some government agencies and firms are obtaining international certifications of their environmental and quality management systems—certifications such as the International Standards Organization (ISO 14000 series) and Quality Standards (9000 se-

ries). These certifications often have market share implications. It is also a fact of life that many corporations sell their products on more than one continent; and increasingly corporations will operate plants in more than one country. The North American Free Trade Agreement (NAFTA) and the continued integration efforts of the European Union (EU) suggest that the trends are moving to more, rather than less, globalization of economic and information activity.

## NEED FOR INTEGRATION OF ENVIRONMENTAL STATUTES

The 1970s are often looked at as the "decade of the environment" in the sense that a plethora of environmental laws were passed, the EPA and OSHA were created as governmental agencies in 1970, and regulation of air quality, water quality, solid waste and toxic materials moved front and center. Earth Days began and were celebrated annually starting on April 22, 1970. Perhaps one of the more prescient and important statutes was Public Law 91-190, the National Environmental Policy Act of 1969 (signed into law by President Richard M. Nixon, January 1, 1970). It is known in common professional jargon simply as "NEPA." Senators Edmund Muskie (D-ME) and Henry M. "Scoop" Jackson (D-WA) championed this legislation in the U.S. Senate.

The procedural requirements of NEPA require not only an assessment by the appropriate federal officials or private-sector consultants of whether or not the project has significant environmental impacts—known as the **environmental assessment (EA)**—but in cases where an **environmental impact statement (EIS)** is written, there must be opportunities for public comment and provisions to address comments of the public and others, such as federal, state, and local government entities. This process can lead to substantive or substantial improvements by designing in mitigation measures, or ways to avoid incurring adverse impacts.

Environmental impact assessments and statements can identify impacts not readily apparent when projects are first developed. For example, the proposed 1984 Louisiana Exposition (Theme—"Fresh Water as a Source of Life") was to be sited

in the "Warehouse District" along the Mississippi River waterfront in New Orleans. In a business-by-business survey, consultants doing the EIS discovered that over 1,750 jobs were within the boundaries to be fenced off for the duration of the six-month Exposition. Projected impacts included firms with these employees having to relocate; but also many firms going out of business with associated job losses. The discovery of the number of jobs and ability to renegotiate the fair "footprint" allowed the city of New Orleans to retain more than 1,000 jobs that otherwise would have been lost. Also, the projections of revenues and number of attendees received attention due to the EIS work performed for the U.S. Department of Commerce ("Social, Economic, and Urban Design Impacts of the Louisiana World Exposition," U.S. Dept. of Commerce, Bureau of International Expositions, 1982).

New fields have emerged from the impasses and conflicts generated by public policy decisions, such as siting locally unwanted (but regionally necessary) facilities. These fields supplement one of our oldest means in the United States of deciding—litigation before a judge or jury. Arbitration and mediated negotiation involve a third party who has a role in decision making or in helping the parties come to an agreement. When there is a responsibility for the third party to make a decision, and that decision is final (not appealable) then binding arbitration may meet the needs of all parties (as occurs in some major league baseball contracts).

Environmental policy is a tool to integrate economic, environmental, and energy impacts into planning for sustainable development. The ideal target is to figure out how populations can improve on individual and community quality of life; analogous to "living on the interest while not depleting the principal in financial terms." This is a tough balancing act considering intergenerational equity and the current pace of 90 million additional people added to the earth's population each year.

## RISKY DECISIONS

Given politics and our individual differences and interests, it is the author's assertion that consensus-based and collaborative processes have an



increasingly important role to play in environmental planning and education. Both involve listening and explicit attention to values, which tend to drive actions of interested parties in conflict situations. Joe Beck and the author argue in their publications that the values, interests, and expectations of stakeholders are the key to understanding their interests and positions in multiparty, multi-issue, disputes. This is not meant to imply that timing, availability of resources, enforcement effectiveness, and other factors are insignificant matters, whether the issues at hand are negotiated (as in negotiated rulemaking) or whether they are brought up in citizen's or agency lawsuits.

An example of a risky decision is the siting of a coal-fired or nuclear-powered generating station. Another example is selection of a technology to destroy stockpiles of mustard gas and nerve gas at eight locations within the continental United States. Conventional wisdom tends to place a premium on "knowing the facts"; we believe parties are selective in citing facts. One may even argue that the preconceived notions of parties tend to drive them to look for the science and scientific experts that support their view of what is important.

A favorite teacher and mentor of the author's once remarked "We all believe in the public interest to the extent that our private ox is not gored" (Professor Harvey Brooks, 1990, personal communication). Although enforcement and fines, injunctions and other penalties must be a part of governmental regulation of economic activity, the author believes that if people understand the implications of pollution on health they can take steps to solve problems, rather than become part of the problem or the perpetuation of the problem. Incentives can motivate behavior and practices.

Programs like the EPA's Project XL and the 33/50 program, as well as the National Academy of Public Administrators' review of the EPA, indicate that cooperative approaches have promise. Also, the Occupational Health and Safety Administration's VPP illustrates the value of moving toward more collaborative approaches to achieve improved results, over and above "compliance." These developments are overdue and encouraging, since industry brings substantial resources to the table and can often use innovation to solve problems.

In order to achieve better results in energy and environmental policy, we must find ways to incorporate sound scientific and technical judgments. Often litigation is costly, time-consuming, and the adversarial proceedings strain relationships that sometimes must survive differences of opinion as well as the different mission orientation of organizations and governmental agencies. Especially in multiparty, multi-issue disputes, alternatives to litigation can meet this overall purpose of using science and scientific experts in a productive manner. There are numerous examples of using **mediation** for **conflict resolution** in environmental health decision making (e.g. Konkel, 1987; Susskind and Ozawa, 1985). Pacific Northwest National Laboratory (PNNL) mediated a future use planning process among more than 20 federal, state, and local agencies, and three distinct Indian tribes in the mid-1990s to set guidelines for development of a Hanford future land use plan at the site managed by the U.S. Department of Energy.

Risk analysis can be used to identify risk factors. For example, studies have shown that diet, exercise, and smoking are risk factors affecting cardiovascular performance. There are many excellent texts on the use and techniques for **risk assessment** (e.g., Moeller, 1997, Chapter 16; Cohnsen and Covello, 1989; Also See "Risk Assessment in the Federal Government: Managing the Process," 1983). The probabilities and consequences of various actions and events are a very useful planning tool. Nevertheless, decisions are not made solely on the basis of engineering calculations and forecasts; social, economic, and political factors are of paramount importance in decisions regarding environmental health programs and policies.

## SUMMARY

Environmental planning is a means of identifying where we want to go, where we are at the present time, and charting a path to achieve the envisioned outcomes. In the public health arena, environmental health planners focus on promotion of behaviors that enhance an individual's or community's health status, including quality of life as well as longevity. In this Chapter a ten-step planning process (and an abbreviated six-step process) show how one moves

from identification of a problem through to the design of programmatic solutions that meet the values, interests, and expectations of interested parties, also known as "**stakeholders**." The process is iterative and dynamic.

The regulatory structure in which the Environmental Protection Agency and the Occupational Safety and Health Administration operate is largely based on "command and control" responses to public policy issues. There are many statutes and associated polices, programs, and rules and regulations that business must comply with in order to be in compliance with the law. There are evolving cooperative and collaborative programs that have promise as agencies and business work to achieve better results. EPA should use comparative risk analysis to help set program priorities and budgets. We are all responsible for stewardship of our natural resources and prevention of injury, illness, and disease in populations—by anticipating problems, setting priorities, preventing pollution, and solving the "right" problems.

## KEY LAW ACRONYMS

CAA—Clean Air Act of 1970, 1990 amendments

CWA—Clean Water Act of 1972, 1977

EA—Environmental Assessment

EIS—Environmental Impact Statement

EPA—United States Environmental Protection Agency

FONSI—Finding of No Significant (Environmental) Impact

NEPA—National Environmental Policy Act of 1969

OSHA—Occupational Safety and Health Administration

OSHAct—Occupational Safety and Health Act of 1970

SWDA—Solid Waste Disposal Act of 1976

TSCA—Toxic Substances Control Act of 1976

## KEY TERMS

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Brownfields, p. 296

Combined sewer overflows (CSOs), p. 288

"Command-and-Control" regulation, p. 296

Comprehensive planning, p. 290

Conflict resolution, p. 298

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## APPENDIX 1

NAPA is the National Association of Public Administrators. The essence of their advice to the EPA is the following:

- Create stronger partnership with state agencies.
- Sector- and community-based approaches have value.
- Develop incentives to encourage better performance.
- Market-based forces should guide action.
- Create the infrastructure to managing in the information age.
- Support the public's right-to-know.
- New approaches to enforcement and compliance.
- Cut red tape and regulatory burdens.



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