

PRECAUTIONARY PRINCIPLE PROJECT

CLEAN WATER FUND ♦ LOWELL CENTER FOR SUSTAINABLE PRODUCTION ♦ MASSACHUSETTS
BREAST CANCER COALITION ♦ SCIENCE & ENVIRONMENTAL HEALTH NETWORK

Putting Precaution into Practice: Implementing the Precautionary Principle

Excerpted from: Tickner, Joel. A Map Toward Precautionary Decision-making. In Raffensperger, C. and J. Tickner, eds. 1999. Protecting Public Health and the Environment: Implementing the Precautionary Principle. Washington, DC: Island Press

This briefing paper presents an overview of the Precautionary Principle and some components of a structure to implement the Principle in environmental health policy. The Precautionary Principle comes into play when there is evidence on the potential for environmental or health damage yet there is uncertainty as to whether the effect has or will occur and its potential magnitude. Precaution is about anticipating and preventing environmental health damage before it occurs. It is about using all the available evidence on hazards and alternatives to make the best possible decisions that prevent harm to human health or the environment. The precautionary principle requires more, not less science than traditional decision-making methods. Decisions to invoke the precautionary principle involve different types of scientific knowledge from a wide range of disciplines and constituencies. They require consideration of interactive and cumulative effects, as well as the effects on individuals and systems. Importantly, they require honesty about uncertainty, what is known, not known, and can be scientifically determined.

The Precautionary Principle requires a fundamental change in three critical aspects of current environmental health decision-making: (1) it changes the questions asked when making decisions under scientific uncertainty; (2) it changes the presumptions about the harm of a particular activity, action or substance (3) it changes how decisions are made about risk and who is involved in the decision-making process.

First, the Precautionary Principle forces scientists and policy decision makers to begin to ask a different set of questions about activities and potential hazards. Current risk-based decision-making approaches ask questions such as: "How much exposure is safe"; "What level of risk is acceptable"; and "How much contamination can a human (usually a healthy adult male) or ecosystem assimilate without showing any obvious adverse effects?" The Precautionary Principle asks a different set of questions such as: "How much contamination can be avoided while still fulfilling objectives?"; "What are the alternatives to this activity that achieve a desired goal (a service, product, etc.)?"; and "Do we need this activity in the first place?"

Changing the questions we ask about a problem (the problem definition) leads to a very different set of public policies. Policies based on the Principle are preventive, whereas those based on current decision-making approaches tend to focus on pollution control and remediation. Precautionary approaches alternatives oriented, lending themselves to technology innovation, pollution prevention, and impact assessment. Policy responses

based on current decision-making approaches generally lead to add-on, end-of-pipe technologies, personal protective equipment, and medical treatment for those negatively impacted. In essence, the Precautionary Principle moves the focus of decision-making (and the questions asked by decision-makers) from one of risks, which are highly uncertain and difficult to measure, to one about solutions to problems, for which we can often have a greater level of certainty.

In addition to changing the questions decision-makers ask about issues, the Precautionary Principle shifts the presumptions used in decision-making. Rather than presume that a specific substance or activity is safe until proven dangerous, a process which takes substantial time and resources, the Principle places a presumption in favor of protecting the environment and public health. This switch of presumption places the responsibility for demonstrating safety and preventing harm on those undertaking potentially harmful activities. Accordingly, humans and the environment receive the benefit of the doubt under scientific uncertainty and ignorance, rather than a particular substance or action.

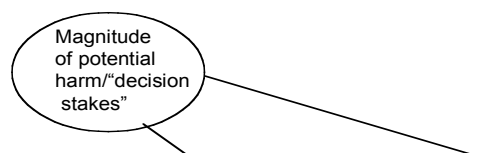
Finally, the precautionary principle demands that those potentially affected by substances and activities have a say in the decision-making process. This requires democratic decision-making processes that are transparent, and structures for involving citizens in the decisions about science and technology. Given the large uncertainties in science and policy, these are policy decisions.

The Precautionary Principle establishes a type of "speed bump," creating bottlenecks in the technology development process but does not stop flows. It establishes a process of seeking the least hazardous alternatives to achieve a specific purpose, and requires continuously updating knowledge so as to avoid harm before it occurs. The goal of instituting a speed bump is to create options in any given situation that are the most "error-friendly," those that would be least prone to environmental or health damage or for which harm would be most reversible. Implementing the Precautionary Principle does not mean that current decision-making tools, such as risk assessment and cost-benefit analysis, are discarded. It does mean, however, that these tools are used to inform decision-making in order to protect health and the environment, rather than to make decisions themselves. Instead of using these techniques to determine an "acceptable" risk, they are used to compare alternatives to an activity (or to establish priorities) which is usually a much less complex and often more clear cut approach, involving less rigorous quantitative analysis and less uncertainty.

The Precautionary Principle can be applied to both new activities and hazards which already exist. Being precautionary about new activities may be easier (politically, economically, and scientifically) than acting on an existing hazard, where economic and political interests are already vested.

A decision-making structure for implementing the Precautionary Principle would be quite different from current decision-making structures based primarily on risk assessment.

A Precautionary Decision-Making Model



Under traditional risk-based decision-making structures (bolded), evidence of harm is collected, the probability of adverse effects is examined through a risk assessment process (looking at both hazard and exposure), and then a risk management decision is made to take or not take action, considering the costs and benefits of regulation as well as other factors. Determination of causal relationships, strong evidence of harm, and level of risk are the central elements of this structure. This structure relies on singular types of information, focuses on individual exposures and individual effects, and tends to hide uncertainty about what is known or not known about a hazard.

Under a precautionary decision-making structure, evidence of harm from multiple sources is considered, as well as evidence of alternatives to prevent harm and the magnitude of possible harm (severity, irreversibility, and scale) from an activity. The latter two are considered just as important in the decision-making process as evidence of harm. In this regard, if there is information about safer alternatives or if the magnitude of potential harm from an activity is great, it may be possible to partially or entirely bypass the costly and often contentious determination of causality that is central to current decision-making structures. For example, if an activity could cause wide-spread, irreversible harm or it could harm sensitive members of a population (for example children), it would be prudent to take action, even before reasonable evidence of harm has been accumulated. At any rate, harm to a small number of people or a limited geographic area should be prevented before causal links are established, especially if alternatives are available. It is also necessary under a precautionary decision-making structure to consider uncertainty, indeterminacy (large scale uncertainty) and ignorance (what we might not know), which are rarely thoroughly evaluated under current structures. Large uncertainty about cause-effect relationships would favor action to prevent harm while further studying the problem. That is action taken in advance of certainty.

Decisions about the likelihood of harm are made under this structure based on a "weight of evidence" approach, taking into consideration all of the available information from various kinds of sources, the magnitude of impacts and availability of alternatives. This differs from the current quantitative approach to decision-making that quantifies risk based on a limited amount of information. A central aspect of this structure is the shifting burdens onto the proponents of potentially harmful activities to provide information on its safety, need for an activity, and availability of alternatives. If reasonable scientific evidence and experience (in contrast to certainty) indicate that harm has or might occur, then the activity would be presumed harmful until proven otherwise.

Some critical elements of a structure to implement the Precautionary Principle in environmental health decision-making are:

1. A general duty to take precautionary action in the face of uncertainty. This would be a government and business responsibility to act in a precautionary way if there is evidence that an activity or substance may pose a risk to human health or the environment. This duty forms part of a Massachusetts constitutional right to a clean and healthy environment. It is also central to the federal Occupational Safety and Health Act. Unfortunately, such duties have not been well enforced in practice.
2. Goal-setting for environmental and public health protection. Instead of just forecasting problems that might occur in the future, we need to be establishing easily understood, far-reaching goals for environmental health (for example children born without persistent pollutants in their bodies). Scandinavian countries set aggressive environmental health goals and then engage society in determining ways to achieve those goals through a process called "backcasting."
3. Shifting burdens of proof to initiators of potentially harmful activities. Typically government agencies and the public must prove harm before preventive or remedial actions are taken. Since companies and those initiating potentially harmful activities have the most information on potential hazards and control the technology, they should have to demonstrate that their activity will not pose undue risks to the public.
4. Democratic decision-making structures. Because decisions regarding health and the environment are "public" decisions, those who might be affected must have a say in the decision-making process. Precaution demands structures, such as layperson juries and citizen panels to ensure that those who might suffer the harm from an activity have an opportunity to participate in determining its "acceptability".

5. Tools to aid decision-making under uncertainty (decision-making criteria). Decision-makers need criteria to guide weight of evidence decisions as to when precautionary action should be taken. These criteria include considerations of the reversibility of the potential hazard; its seriousness; whether it will affect future generations; availability of alternatives; need for the activity; how strong the evidence is of potential harm; and the level of uncertainty about the problem.
6. Prevention-oriented methods to carry out precaution-based decisions. The Massachusetts Toxics Use Reduction Act provides an excellent example of a method for carrying out precaution-based decisions. Under the Act, companies must examine how they use toxic chemicals and develop a plan for how they will reduce their use. They do not engage in discussions about the acceptable risk from a pollutant. Other methods for carrying out precautionary action include: Clean Production (a more holistic version of Toxics Use Reduction that looks at water use, energy, and product lifecycles); pre-market testing; limitations on activities pending further study; chemical bans and phase-outs; alternatives assessment; and health based exposure limits.
7. Economic incentives to promote precaution. Polluters should be responsible for paying the full costs associated with the health and environmental damage they create (especially if there was evidence to indicate that such impacts might occur). A “polluter pays” principle provides an economic incentive to companies to prevent harm in the face of uncertainty. Examples of the costs of not taking precaution and the benefits of taking precaution are needed.
8. Means to continuously measure potential adverse effects of both current and alternative activities. Under the Precautionary Principle, environmental health decisions should not be a once and for all activity. There must be flexibility to update decisions as new information is received. Even decisions based on the Precautionary Principle should be regularly re-examined to ensure that the safest course of action has been taken. Those undertaking activities that might damage health or the environment need to be continuously examine their activities to identify potential harm, to inform decision makers and the public when a risk might exist; and to act to prevent potential harm. Structures to independently and publicly monitor these analyses must exist to ensure that they are both honest and thorough. In addition, we need to continuously vigilant of alternatives to harmful activities to ensure that they themselves do not lead to some unexpected damage.

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