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From Science to Policy: Developing Responses to Climate Change

Policy choices are guided by several principles. These include considerations of equity, efficiency and political feasibility. The usual public health ethics considerations may also apply: respect for autonomy, nonmaleficence (not doing bad), and justice and beneficence (doing good).

To make informed decisions about climate change, policy-makers will need timely and useful information about the possible consequences of climate change, people's perceptions of those consequences, available adaptation options, and the benefits of slowing the rate of climate change.[1] The challenge for researchers is to provide this information.

Once policy-makers have received input from the impact assessment community, they must integrate this information into a broader policy portfolio. Response options include actions to mitigate greenhouse gas emissions to slow the rate of climate change; measures to adapt to a changing climate in order to increase society's resilience to the changes that are coming; activities to increase the public's awareness of the climate change issue; investments in monitoring and surveillance systems; and investments in research to reduce key policy-relevant uncertainties.

Climate change, however, should not be considered in isolation from other global environmental stresses. Further, policy-makers usually deal with multiple social objectives (e.g., poverty elimination, promotion of economic growth, protection of cultural resources), while competing stakeholder desires compound the allocation of scarce resources. Climate change should therefore be viewed as part of the larger challenge of sustainable development.

Using the information provided by the research community, risk managers must make decisions despite the existence of scientific uncertainties. Policy-focused assessments analyze the best available scientific and socioeconomic information to answer questions being asked by risk managers. They characterize and, if possible, quantify scientific uncertainties to the extent possible, and explain the potential implications of the uncertainties for the outcomes of concern to the decision makers. Ultimately, it is up to society to decide whether a perceived risk warrants action. But the scientific uncertainty, by itself, does not excuse delay or inaction.

Decision-making criteria.

Many different criteria exist for making decisions about climate change policy. Two approaches to decision making that are often discussed are the "precautionary principle" and "benefit-cost" analysis.

The precautionary principle is a risk management principle applied when a potentially serious risk exists, but significant scientific uncertainty also exists.[2] The precautionary principle allows some risks to be deemed unacceptable not because they have a high probability of occurring, but because the consequences if they occur may be severe or irreversible. This principle was featured in the 1992 Rio Declaration on Environment and Development as Principle 15, stating:
"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

Another widely used approach is the "benefit-cost" criterion, weighting the expected benefits and costs of a proposed action. Questions arise about how benefits and costs should be measured, and how they should be compared among different societies. The benefit-cost criterion emphasizes the efficient use of scarce resources – but does not deal with equity. Nor does it deal well with consequences that are displaced into the future, and therefore, by economic convention, often discounted. Climate change has the potential for catastrophic outcomes in the distant future, the "present value" of which would be small if discounted. Despite these concerns, benefit-cost analysis should not be dismissed. This would only deprive decision makers of one set of insightful information.

Response Options

The mitigation of greenhouse gases provides a mechanism for slowing, and perhaps eventually halting, the

buildup of greenhouse gases in the atmosphere. A slowing of the rate of warming could yield important benefits in the form of reduced impacts to human health and other systems; however, the inertia in the climate system means that there will be a significant temporal lag between emission reduction and slowing in the rate of warming.

Adaptation (discussed in section 11, above) is another important response option. Such actions enhance the resilience of vulnerable systems, thereby reducing potential damages from climate change and climate variability.

Communication of information about climate change, its potential health impacts, and response strategies, is itself a public policy response to climate change. So, too, are the development and implementation of monitoring and surveillance systems, and investments in research. Monitoring and surveillance systems are integral and essential to providing the information needed to support decisions by public health officials.

Building the Bridge from Science to Policy: Policy-focused Assessment

Policy-focused assessment is a process that can help resource managers and other decision makers meet the challenge of assembling an effective policy portfolio. It is a process by which the best-available scientific information can be translated into terms that are meaningful to policy makers. A policy-focused assessment is more than just a synthesis of scientific information or an evaluation of the state of science. Rather, it involves the analysis of information from multiple disciplines – including the social and economic sciences – to answer the specific questions being asked by stakeholders. And it includes an analysis of adaptation options to improve society's ability to respond effectively to risks and opportunities as they emerge. Formulating good policy requires understanding the variability in vulnerability across population sub-groups, and the reasons for that variability.

In the assessment of adaptation options, a number of factors related to the design and implementation of strategies need to be considered. These include the fact that (1) the appropriateness and effectiveness of adaptation options will vary by region and across demographic groups; (2) adaptation comes at a cost; (3) some strategies exist that would reduce risks posed by climate change, whether or not the effects of climate change are realized; (4) the systemic nature of climate impacts complicates the development of adaptation policy; and (5) maladaptation can result in negative effects that are as serious as the climate-induced effects being avoided.

Complicating the assessment process is the fact that there are significant scientific and socioeconomic uncertainties related to climate change and its potential consequences for human health. Uncertainties exist about the potential magnitude, timing and effects of climate change; the sensitivity of particular health outcomes to current climatic conditions (i.e., to weather, climate, and climate-induced changes in ecosystems); the future health status of potentially affected populations (in the absence of climate change); the effectiveness of different courses of action to adequately address the potential impacts; and the shape of future society (e.g., changes in socioeconomic and technological factors). A challenge for assessors is to characterize the uncertainties and explain their implications for the questions of concern to the decision makers and stakeholders. If uncertainty is not directly addressed as part of the analysis, a health impacts assessment can produce misleading results and possibly contribute to ill-informed decisions.

Public Awareness: Communicating Assessment Results

Stakeholders should be engaged throughout an assessment process. A communication strategy must ensure access to information, presentation of information in a usable form, and guidance on how to use the information. Risk communication is a complex, multidisciplinary, and evolving process. Often information has to be tailored to the specific needs of risk managers in specific geographic areas and demographic groups. This requires close interaction between information providers and those who need the information to make decisions.

Conclusion

Some have argued that the existence of scientific uncertainties precludes policy makers from taking action today in anticipation of climate change. This is not true. In fact, policy makers, resource managers, and other stakeholders, despite the existence of uncertainties, make decisions every day. The outcomes of these decisions may be affected by climate change. Or the decisions may foreclose future opportunities to adapt to climate change. Hence, the decision makers would benefit from information about the likely impacts of climate change. An informed decision is always better than an uninformed decision.

Care must be taken to respect the boundary between assessment and policy formation. The goal of policy-focused assessment is to inform decision-makers, not to make specific policy recommendations.