Developing an Urban Heat Island Mitigation Policy

Understanding the relationship between science and society in environmental policy

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Abstract

The City of San Diego is currently developing an Urban Heat Island Mitigation Policy and Program, which is an important new type of environmental policy. This study will look at the interaction between science and government, between government and other organizations, the role of public participation, and how knowledge is transferred and shared between these realms in regard to policy development. This study is significant because it will examine how this policy fits into the framework of Sustainability Science. These issues will be addressed by conducting extensive interviews, engaging in participant observation, surveys, and analyzing documents. This research will contribute to the current literature about Sustainability Science, and will provide information how these theories are being utilized in a city context, which policy-makers can learn from and use when developing other types of innovative policy.

Introduction

The development of an Urban Heat Island effect (UHI) mitigation policy and program in the City of San Diego represents a new type of environmental policy that is being developed in local governments around the state and nation. This study seeks to understand how the City of San Diego has come to lead the nation in environmental policy development in its goal to mitigate the effects of the UHI. In order to understand their involvement the study will look at the role that science is playing in the development of policy and specifically how knowledge is shared and transferred between the governmental and scientific realm. This study seeks to understand these processes in order to critically look at why this new type of environmental policy is being created a this point in time and how different actors influenced and exert control over the process. The development of an UHI policy falls into line with the ideas that are found within the interdisciplinary field of Sustainability Science. This study will be able to provide a case study of how and to what extent a city government uses the ideas found within Sustainability Science. It will provide other policy-makers and involved individuals with an example of how these theories can be utilized at a local level, and will provide lessons for future policy development.

This study is based upon two basic assumptions. The first is that there are serious problems with the state of the environment and that humans have the power to improve these conditions. The second assumption is that the field of Sustainability Science does hold some hope of improving the way policy is developed and could lead to a more sustainable policies and development. These principles will invariably shape the course of the study and will be present in the way that data is interpreted to some degree.

Conceptual Framework

The primary conceptual issue being dealt with in this study is how the development of this policy is reflecting or fitting in line with the fundamental model that is provided by Sustainability Science. This field seeks to understand the interactions between science and society and to permit different social actors to work together through the integration of different ways of knowing and learning (Kates, Clark et al. 2001). This study will look at the development of an UHI policy and will examine the extent to which it is accomplishing these fundamental goals. This will be determined by looking at three core issues. The first issue that will be examined is the interactions between science and society, and particularly the knowledge transfer between science and city government. The second issue that will be looked at is the collaboration between the City and other non-governmental boundary agencies. Finally the last question that will be examined is how the public is being engaged in this process and the role that their participation is playing in the development of this policy. All of the questions that will be addressed in this research make up the framework and model that is outlined by the fiend of Sustainability Science.

Current Literature: Tracing the shift in environmental policy and the emergence and discourse of Sustainability Science

From the 1970's, when the first pieces of major federal environmental legislation were introduced, to today there has a been a shift in terms of the types of environmental legislation, policy, and programs enacted, as well as a shift in the role that science has played in the development of this type of policy. After World War II, with the Cold War in particular, science began to take on a new position in American society. Science was

seen to be the provider of truth and reason, and above all something that had the ability to provide answers to our problems (Karl 2002). Scientists were given the task of defining standards of performance, and more importantly the task of defining what was "unreasonable risk to human health (Houck 2003). The federal government had complete faith that these individuals had the knowledge and ability to come up with definite answers to these questions. Scientists did come up with answers and created the system of command and control regulation in which the government commands the target levels for pollution reduction, which were determined by scientists, and controls the ways in which they must reach these targets (Pezzoli 2000). This so-called first generation of environmental policy was full of limitations, which in the end caused most of this type of legislation to be inadequate. An important limitation was that the policies solely focused on point-source emissions, the emission of a pollutant from a single source such as a smokestack, and gave no attention to non-point source pollution (Pezzoli 2000). Another issue was that the decision making, research, and policy all dealt with environmental issues in a compartmentalized way, in which no look was given to how pollutants, regulations, or organizations interacted and or were connected to each other (Council 1999). As these types of regulations continued throughout the end of the twentieth century, it became evident that due the complex conditions that existed in society, there was no one absolute solution to environmental problems because most of these issues were the product of the interaction and combination of technological, governmental, scientific, and natural circumstances (Rosenbaum 2002).

Due to the realized limitations of the first generation environmental policy, there has been a shift in environmental regulation and management in the last decade. No

longer is the federal government coming out with command and control type of regulations that creates mandates for the states and localities to follow. Instead individual agencies, and more often, local and regional governments are leading the way in developing innovative environmental policies and programs that seek to find more integrative ways to manage complex, non-point source, environmental issues as a way to create more sustainable communities (Rosenbaum 2002). This change is significant, because as localities are finding innovative ways to address environmental pollution and climate change, the role that science plays in policy development is also changing. The field of Sustainability Science emphasizes the idea that scientific and technological knowledge is still a necessity in the development of policy, but now more attention needs to be given to the connection between nature and society, and to the ways in which scientific research can aid society in the move towards sustainable development.

Sustainability Science is a field that seeks to understand the interaction of global processes with the ecological and social characteristics of places and sectors. This new way of understanding and learning will permit different social actors to work together (Kates, Clark et al. 2001). Sustainability science emphasizes the desire to use co-produced knowledge and collaboration between society and science, not just as an academic exercise, but instead as a way of finding feasible and practical solutions that will eventually lead us down the path towards sustainability. One way that this issue has been addressed is by examining how knowledge is shared and transferred. One argument states "…efforts to mobilize science and technology for sustainability are more likely to be effective when they [institutions] are able to manage the boundaries between knowledge and action in ways that simultaneously enhance the salience, credibility, and

legitimacy of the information they produce (Cash, Clark et al. 2003).” This excerpt highlights the importance of communication between different actors and the need to bridge gaps to facilitate mutual comprehension of the presented knowledge (Cash, Clark et al. 2003). One fault that can be found with this type of argument is that it in some respects follows the traditional line of reasoning, in terms of how science and technology are viewed. There is still that assumption that scientific knowledge is the answer to all of the problems, and that up until now, that information was just not being conveyed in productive ways. It does not discuss in any way the ways in which scientific knowledge, especially when applied to politics, can be problematic.

While the integration of science and policy making is an innovative approach to environmental policy making, it must be acknowledged that there are some inherent problems that come with this course of action. The first is that science has its own agenda and is an independent political actor with interests, strategies, motivations, and institutions all its own. This argument means that no scientific knowledge is going be neutral, unbiased, or the absolute truth (Andresen, Skodvin et al. 2000). Due to this idea, all scientific research must be examined in relation to the rest of society. Another concern that has been raised is that of politics interfering with scientific research by introducing incentives to sway research results. Decision-makers must find a way to utilize the scientific knowledge and ask policy relevant questions about potential impacts, without demanding particular answers (Andresen, Skodvin et al. 2000). Finally there is the issue that by placing so much importance on integrating science and social policy making, that citizens, who have the most stake in the outcome of environmental programs, are completely left out.

It has been argued that the science-policy interface must be reframed in order to include citizens because these individuals hold knowledge about the local region and deserve to have an input about what is happening in their communities (Backstrand 2003). It is also important to look at whose knowledge is being represented when science and policy makers work exclusively with each other, and what knowledge is being represented as true and legitimate. With this viewpoint, it is argued that a more participatory account of scientific expertise, in which science is engaged in open communication with the public, is inherently expressed (Backstrand 2003).

The research that examines the central issues of Sustainability Science offers many theories about why this field would be beneficial in moving society towards a more sustainable future, and some even offer types of organizations or management styles that could be used to achieve these goals. Several studies argue for the use of boundary type institutions (Andresen, Skodvin et al. 2000; Cash, Clark et al. 2003). These would be arenas that are organized as buffers in which scientific knowledge and the concerns of the policy makers can be brought together without disrupting the internal systems of either realm. Another study argues for the use of adaptive management systems in which policies are treated like experiments, where they are designed so that lessons can be learned from their implementation (Council 1999). What is missing from all of the current research is case studies that show how to institute the type of change in organizations and management systems that Sustainability Science calls for. This study seeks to fill this gap left by the other literature that currently exists by examining how science and government interactions are working within the City of San Diego.

Methodology

Setting

In order to understand the issues of how and why the city is developing an UHI policy and the role that science and public participation in this process, I obtained an internship with the City of San Diego Environmental Services Department and began working within the Sustainable Communities Programs, with the people who were put in charge of developing this policy.

Data

To answer the questions about the development of an UHI policy and program, several different research methods will be used. The first method used will be extensive interviews. These interviews will be done with individuals from different disciplines, who are all involved in some way with looking at the UHI issue, in order to understand the different perspectives that are coming together to form this policy. The first people I will interview will be with those who work within the city government who are directly responsible for writing the policy. Interviews with these individuals will allow for information to be gathered that will show how they are approaching this issue, strategies they are using, and how collaboration fits into the development of policy making. The next individual that I will interview will be the Project Coordinator from the International Council for Local Environmental Initiatives (ICLEI). This interview will provide insight into the role of an intermediary and how they are able to coordinate and connect individuals from different regions and disciplines. Finally, interviews will be conducted with individuals from the scientific community who are involved with UHI research and who interact with policy-makers. By speaking with the scientists involved, it will allow

for an understanding of how and why the scientific community has become involved in the development of innovative types of environmental policy.

While interviews will make up the backbone of the research, other methods will also be used to try and answer the questions about the UHI policy development that have been raised. Participant observation of public forums on UHI and climate change, which are put on by the City of San Diego, will be used to understand how the city is interacting not only with the public but also with individuals from other city governments and agencies. Examining forums is important because they demonstrate how the city is choosing to involve people outside of San Diego government. It important to see what information the city chooses to disseminate to these other actors, how they do it, and what ways, if any, they incorporate the ideas of others into their policy.

Finally the last research method that will be used is the analysis of primary documents. Personal communications, information sheets distributed at forums, and transcripts from meetings and forums will be utilized to understand how knowledge is being shared, and how this transfer of ideas will impact the development of the UHI policy. The participant observation of public forums is already complete, and most primary documents have already been gathered. The interviews and analysis portion of the research will be started at the beginning of January and will be complete a couple weeks before the March deadline.

Concluding Remarks

This study expects to provide a detailed case study that examines the way in which the City of San Diego has become involved in creating progressive environmental policy. In addition the development of this policy will demonstrate how and why this city

government was able incorporate the principles of Sustainability Science in the creation of an environmental policy. This study will fill the gap left in current literature, which does not provide very many concrete examples of how cities have used these theories in specific policies. This study will then provide policy-makers in other cities with a way to see how they too might be able to find ways to integrate different disciplines and viewpoints into their own environmental policies.

Bibliography

Andresen, S., T. Skodvin, et al. (2000). Science and Politics in International Environmental Regimes. NY, Manchester University Press.

Andresen, S., T. Skodvin, et al. (2000). Science and Politics in International Environmental Regimes. New York, NY, Manchester University Press.

Backstrand, K. (2003). "Civic Science for Sustainability: Reframing the Role of Experts, Policy-Makers, and Citizens in Environmental Governance." Global Environmental Politics **3**(4): 28.

Cash, D. W., W. C. Clark, et al. (2003). "Knowledge systems for sustainable development." Proc Natl Acad Sci U S A **100**(14): 8086-91.

Council, N. R. (1999). Our Common Journey: A Transition Toward Sustainability. Washington D.C., National Academy Press.

Houck, O. (2003). "Tales from a Troubled Marriage: Science and Law in Environmental Policy." Science **302**(5652): 1926-9.

Karl, H. a. T., C (2002). "A Model Project for Exploring the Role of Sustainability Science in a Citizen-Centered, Collaborative Decision-Making Process." Human Ecology Review **9**(1): 67.

Kates, R. W., W. C. Clark, et al. (2001). "Environment and development. Sustainability science." Science **292**(5517): 641-2.

Pezzoli, K. (2000). "Environmental Management Systems (EMSs) and Regulatory Innovation." California Western Law Review **36**(2): 335-365.

Rosenbaum, W. A. (2002). Environmental Politics and Policy. Washington D.C., Congressional Quarterly.