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From Progress to Disaster: A Case of Environmental Injustice

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Abstract: Often, when policy fosters abuse and failure for people that it is designed to support, disaster arrives and a call for social change emerges among groups who experience such disaster. Not only can disaster spark social change, it also serves as an opportunity to drive movement for policy reform. This article looks at the role of policy in disaster by exploring a case of environmental injustice according to the publically told lived experience of a University of California Berkley faculty member. The discussion of this paper structures disaster as an incentive for social change and policy reform. The article considers specific cultural narratives that help illuminate political processes that produced atrazine as disaster. I frame the problems outlined in this analysis as a product of economic and institutional violence. The stories provided in this analysis are largely based on investigator to subject interview results from "The New Yorker" and "National Public Radio". Additional references are extracted from a variety of sources. The illustrations of this article are designed to contribute to policy anthropology discourse. The overarching objective of this paper is to reach the awareness of civic audiences with information about specific environmental injustices that might motivate such audiences to exercise civic power to advocate for humanistic policy reform.

Introduction

Uncovering stories that underlie social injustices offers hope for disaster recovery. Particularly, looking at specific cultural narratives and social processes can provide a way for us to make sense of policies that lie beneath social problems. Using an anthropological approach to assess policy is useful in understanding policy's role in disaster. Policy describes the guiding principles for the organization of societal institutions. Policy is often defined as an objective and neutral process. However, the formulation of policy is driven by human values and ideals. As John Grimley (1986) describes, policy is a social apparatus that expresses the ideas of prevailing social and political groups and that "policy encapsulates a notion of what ought to be, according to the particular values of the formulating body." Still, conventional rhetoric that describes policy is that which affirms policy as a natural and objective occurrence of decisions and rules. Humans invariably develop policy. Since humans hold personal ideals and beliefs, subjectivity is unvaryingly injected into policy making. Thus, policy is a representation of human biases, and policy is ritualistically tailored to the discrete ideologies and values of the social institutions and individuals that it derives from. Through policy development research, Raymond Apthorpe (1986) uses an anthropological perspective to analyze policy theory and the process of policy. Apthorpe (1986) argues that policy is acknowledged as effective and efficient, yet it is fundamentally political. The use of 'expert' knowledge is held as the basis for design of institutional standards and policies that promote the cultural and political goals of specific groups (Apthorpe, 1986). The modern quality of political power is apparent through

policy's disguise of neutrality. The reality that policy is a non-straight forward and complex process makes it more vulnerable to subjectivity and empowered groups who might use policy to exercise power. Grimley and Apthorpe's arguments dictate that policy is problematic. Inescapably, if policy is designed around the objectives of a few, many will be harmed. When such failure in policy development occurs, the potential adversities derived from policy rest within the risk of disaster.

Anthropological Perspectives of Disaster

Disaster prevalently denotes a natural occurrence of nature, yet disaster has specific cultural meaning and cause. From a cultural perspective, disaster suggests failures within human constructed systems. Policy, a frequently common thread shared among disasters, provides insight for questions about cause and effect of disaster. One salient example of how policy influences disaster is depicted in the 2005 storm devastation left behind by Hurricane Katrina in the United States gulf coast region.

As an emblem for societal recognition of social disaster, Hurricane Katrina became a cultural lens for how policy molds disaster. As Susanna Hoffman (2006) conveys, disasters are revealers. Disasters illustrate societal problems that have been operating soundlessly and societal groups that have been subjected to vulnerabilities (Hoffman, 2006). Hoffman reasons that disasters are social outcomes that are brewed over long periods of time. In the example of Hurricane Katrina, the impoverished, uneducated, and underemployed residents of New Orleans, whom were observed across the media of the United States during the aftermath of Hurricane Katrina, existed before the storm (Hoffman, 2006). The New Orleans residents that lived the experience of poverty, lack of education, unemployment, and lack of access to many resources were a distant outcome of policy and vulnerable to subsequent dangers in the face of Hurricane Katrina. Hoffman highlights that policy induced disaster also involves risk taking such as those risks taken in light of deteriorating levee systems in New Orleans. Hoffman makes a clear case that failing levees were left unaddressed by policy because those most susceptible to potential harm from levee damage were generally poor, marginalized groups. Yet, perhaps the most disastrous events noted following Hurricane Katrina were illustrated within the social systems of affected communities. "Fracturing social structure", as Hoffman asserts, is the aftermath of social disaster. Not only were residents of New Orleans displaced from their communities and homes, they faced loss of recognizable physical communities, an erased sense of place, and the presence of outsiders - who came with new political values and agendas after Hurricane Katrina. This subjected vulnerable legacy residents and communities of New Orleans to more social destruction amid existing vulnerabilities.

Another social framework of disaster derives from disaster research of Gary Kreps. Kreps (1995) argues that disaster involves social disruption and physical harm. He underscores that disaster includes key markers including "length of forewarning, magnitude of impact, scope of impact, and duration of impact". Specifically, events of disaster can be defined by a short or long warning period, low to high severity of socially defined disruptions and physical harm, localized or diffuse impacts, and short to indefinite time frames from start to end (Kreps, 1995).

One case study that corresponds to Kreps' markers of disaster is understood through the lived experience of a University of California (UC) Berkeley faculty member, Tyrone Hayes. Through Hayes' told lived experience, specific policy is understood as a

trigger for disaster. Particularly, Kreps' markers can be identified through the projection of life events described by Hayes such as events that were diffuse in terms of impact; events that rendered severe social disruption for Hayes; events that were preceded by a moderate period of warning; and events that were open-ended in terms of period for which the effects began and would end.

Syngenta against Tyrone Hayes

Tyrone Hayes, a biologist and professor of integrative biology at UC Berkley, was hired in the late 1990's by Syngenta, producer of the once most widely worldwide used herbicide atrazine to study the effects of atrazine on male frogs (Aviv, 2014). According to research results of Hayes' study of the effects of atrazine on male frogs, atrazine produced harmful effects on the health of male frogs. Particularly, Hayes' study revealed that the use of low levels (.1 part per billion) of the chemical compound atrazine interfered with the function of the endocrine system for his lab amphibians (NPR, 2014). His data supported the conclusion that interference of the frogs' endocrine system was reflected through hormonal imbalance symptoms. Principally, the test subject male frogs exhibited cross reproductive qualities after low-level application of atrazine such that male frogs developed ovaries in addition to testes. Hayes theorized that because the amphibian reproductive system and the human reproductive system are comparable, the effects of atrazine pose similar risks to the function of the human endocrine system. Through additional hypothesizing and scientific reasoning, Hayes linked atrazine to specific human diseases including cancer as well as various human reproductive ailments. Hayes recognized that the maker of atrazine, Syngenta, was also stakeholder in the marketing of a pharmaceutical drug, which was used to combat cancer by blocking known irregular estrogen producing effects of the chemical compound atrazine.

According to Hayes, Syngenta responded to his study claims first by proposing to purchase Hayes' data and finally by requesting that Hayes' findings remain undisclosed to civic audiences. Despite Syngenta's quest to cease disclosure of his data, Hayes continued to pursue public disclosure of his research findings about atrazine. Following Hayes' disobedience to Syngenta's request, a litigious decade long battle ensued between Hayes and Syngenta. Through Hayes' public reports, litigation was complemented by what Hayes described as abuse and personal harm derived from Syngenta as well lack of support from leadership at UC Berkeley [more reading about Tyrone Hayes' account of litigation with Syngenta available here http://www.newyorker.com/magazine/2014/02/10/a-valuable-reputation]. As Hayes used public talks to reveal the environmental and biological harms of atrazine as well as to share the various personal harms that became inflicted on him by Syngenta, it could be inferred that Hayes' human rights were being demolished at the hands of Syngenta's economic weight and influence.

Engaging with Atrazine

Atrazine is an herbicide that is frequently used in agricultural production to destroy the development of specific weed varieties for crops and other land uses (Chemical Review, 2014). Atrazine was once the most widely used pesticide in US agricultural production (Aviv, 2014). As early as 2001 atrazine was the most extensively detected pesticide toxin found in drinking water in the US (Gilliom RJ et al, 2007). Studies conducted by the EPA have shown that when atrazine is applied to soil, it remains in soil for several months and

leaches into ground water (EPA, 2007). As a result of atrazine's groundwater contaminant effects and inconclusive findings about human safety and health effects of atrazine, atrazine was banned by the European Union in 2004 (EDEXIM, 2014). However, the US Environmental Protection Agency (EPA) reregistered atrazine in 2004 under the conclusion that atrazine posed no substantial harm to human health (EPA, 2003). In the 2007 release of the EPA's toxicity summary of atrazine, study assessments noted that atrazine poses disruption to the endocrine system in humans (EPA, 2007). The study also found high levels of atrazine in groundwater in regions where atrazine is commonly used (EPA, 2007). Conclusions from the EPA's study also revealed that pubertal alterations occurred (in experimental animal studies) as a result of exposure to atrazine (EPA, 2007). Increasing incidents of infants born with congenital disorders (Benson, 2012) were discovered in areas where high concentrations of atrazine were applied. In the 2002 study on atrazine conducted by Tyrone Hayes, male frogs exposed to low levels of atrazine exhibited both male and female reproductive characteristics (Briggs, 2002). In 2008, a group of investigators found that tadpoles sustained deformed hearts and damaged kidneys and digestive systems as a result of exposure to atrazine during developmental stages of life (Lenkowski JR et al, 2008).

Despite studies about the adverse effects of atrazine, post-Hayes studies funded by Syngenta, which concluded atrazine did not adversely affect hormonal development or the functioning of the endocrine system in amphibians, influenced the EPA's decisions to approve atrazine for US market use (Aviv, 2014). Importantly, such experiments sponsored by Syngenta led to findings that all studies that revealed atrazine's adverse effects on amphibians were methodologically flawed and were not reproducible (Jooste et al, 2005). Yet, according to specific colleagues of Hayes, testing methods employed through the experiments of Hayes were defensible and scientifically reliable. Hayes placed doubt on the integrity of Syngenta's experiments when he cited that Syngenta's experiments were not comparable to his own studies because Syngenta used a unique testing design that unsurprisingly produced different results (Aviv, 2014). Hayes continued to produce studies on atrazine and in 2010 his testing concluded that atrazine exposure turned one in ten male frogs into females for 75% of a tested frog sample (Hayes, 2010). In Hayes' 2014 interview on National Public Radio's "Democracy Now," he indicated that 22 independent scientists from 12 different countries, who were not funded by Syngenta, reproduced the results of his experiment (NPR, 2014). According to additional statements made by Hayes, the EPA's decision to ignore warnings of atrazine's dangers to public health and to proceed with registration of atrazine was served by conflict of interest through an EPA advisory panel member who provided counsel for the EPA while also receiving monies from Syngenta (NPR, 2014).

In 2014, Rachael Aviv, journalist for "The New Yorker", examined the life story of the regulatory process for pesticides in the US. In Aviv's delineation of the regulatory process, the US regulatory process was characterized as being fundamentally regulated by industry (Aviv, 2014). Particularly, big corporations influence an enormous scale of regulatory decisions as a result of industry's power to pursue regulators for legal action if errors are discovered in scientific record (Aviv, 2014); this seems to be one basis for why the EPA's regulatory decisions seem to uphold the agenda of industry and ignore scientific evidence in many cases. In addition to industry's involvement in regulation processes, cost

based analysis, that evaluate the economic costs of disease and social disruption versus costs of removing or keeping a chemical in use, impact regulation (Aviv, 2014).

In 2006, Syngenta hired an economist, a University of Chicago faculty member, to conduct an economic impact study about the effects of removing atrazine from use in the United States. The study's conclusion determined that a ban on atrazine would have a damaging effect on the US economy. According to litigation records -disclosed following litigation proceedings between Hayes and Syngenta- Syngenta was actively involved in engineering the outcome of the study (Aviv, 2014). Yet, information resulting from Syngenta's economic impact assessment informed the EPA's cost benefit analysis of atrazine (Aviv, 2014). In addition to using its economic impact study to influence the EPA, Syngenta targeted influential mediums with the findings of the economic impact study such as revealing results to participants at a National Press Club Event in Washington D.C in 2006 (Aviv, 2014). Lisa Heinzerling, former EPA senior climate-policy counsel, commented that regulatory decision processes seem objective (Aviv, 2014). But the complex algorithms "quietly condone a tremendous amount of risk" (Aviv, 2014). Such practices help reveal how policy development processes ignore risks and dangers and create an environment for disaster. Heinzerling criticized the EPA's regulation process when she commented, "A rule will go through years of scientific reviews and cost-benefit analyses, and then at the final stage it doesn't pass," she said. "It has a terrible, demoralizing effect on the culture at the E.P.A. (Aviv, 2014). "

The EPA regulation process is also subject to the tendency of industry to slow the pace of regulation by casting uncertainty on science. In the 2008 publication, "Doubt is Their Product", David Michaels asserts that industry uses "sound science", the industry practice of manufacturing doubt about the soundness of science records, to halt regulation. To avoid legal claims that might result from potential error in scientific record, the EPA becomes skeptical to move forward with regulation that is challenged by the notion of 'sound science' (Michaels, 2008). The use of sound science as a tactic to challenge regulation is one way that policy fails its constituents. In the case of atrazine, sound science created the opportunity for substantial warnings to be ignored and a scientifically known harmful chemical to be registered by the EPA.

Atrazine, Vital to Growth

Atrazine is positioned to be essential for economic growth and progress for the US. Paradoxically, the use of atrazine signals costs which arguably outweigh its benefits. An EPA investigation found that without atrazine the national corn yield would fall by six per cent, creating an annual loss of nearly two billion dollars (Aviv, 2014). Such an assertion frames atrazine as an economic life line, yet considering costs associated with atrazine's use such as environmental clean-up in light of contamination, treatment and medical expenses for those adversely affected by atrazine, human loss, and distant damages that arise following ecological imbalances, it's unlikely to recognize atrazine as favorable for economic growth. For example, in 2012 Syngenta agreed to meet payment terms for a class-action lawsuit settlement of one hundred and five million dollars to reimburse more than one thousand water systems for the cost of filtering atrazine from drinking water (Aviv, 2014). Further, an estimated thirty million Americans are exposed to trace amounts of the chemical (Aviv, 2014); this likely will lead to future expense in the face of human health ailments and medical treatments.

Additional costs associated with atrazine relate to the social harms that many have incurred as a result of policy associated with atrazine's employment. Tyrone Hayes' accounts of personal abuse from Syngenta are an exemplar of economic and institutional violence. However, many more scientists' lives have been disturbed by Syngenta's economic force. Particularly, through high impact media and political campaigns, Syngenta forged discredibility for the research work of scientists who revealed atrazine's negative health effects (Aviv, 2014). Syngenta's campaign against scientific credibility left those impacted ostracized, silenced, blackballed, and in some cases threatened by physical harm.

The EPA and legislative bodies were forewarned over a significant period of time about the health hazards of atrazine, yet appropriate policy action was stalled by Syngenta's economic power. Consequently, disaster describes the greatest cost of atrazine while the full impact of atrazine is still to be assessed.

A Call to Action

The messages and lived experiences that Hayes conveyed publically help aid social change and signal a future that might order policy reform. Social movement which stems from Hayes' told lived experience captures a spirit of rage against the machine, an essence coined by the iconic 90's rock band that held relatively radical political views to challenge unequitable practices of prevailing political institutions. Chiefly, large publics are developing with passion to rally against social institutions that subject humans to social and environmental injustices such as the case of atrazine. Particularly, groups with already fervent campaigns – against dangerous agribusiness practices- are drawing greater support from civic and scientific communities alike. Science communities, once gagged by economic pressures from big business, are surfacing public mediums with a strong voice. Coalitions of scientists are pushing information beyond scholarly communities to the public. Such information is being disseminated through mediums that permit scientists, activists, environmentalists, and citizens to talk and act on numerous extant ecological and human health hazards.

Reflection

The case of atrazine represents one of many environmental hazards for human health, yet it is an advent for the development of public awareness and action for a number of urgent human health and environmental problems that we live with everyday. It is practical to look at the event of Syngenta against Hayes as an example of how failures in policy can impose disaster and compromise the future of progress. Syngenta's economic vitality allowed it to shape and manipulate policy while human populations became subject to environmental dangers. This marked a system of political values that was good for a few and bad for many and ultimately invited disaster. This angle of understanding how policy can produce disaster is useful for approaching a remedy for social injustices. As communities of scientists and activists continue to bring forward information about various ecological and human health risks, and as civic populations continue to look for change, humanistic policy reform is a hopeful way to discharge the potential for future political disaster.

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