



Environmental Justice, Toxicology and Politics

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Commentary

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Abstract

The Earth and all its inhabitants, including humans, regardless of color, race, income level, or nationality, should be treated with respect as to the implementation and / or enforcement of environmental policies, laws or imposed regulations. Climate change and contaminants can strip an urban community from their basic living needs, and a subsistence community from depletion of natural survival resources. This short commentary addresses that all people should have access to the decision making processes of environmental and health hazards, assessment of legacy toxins and risk management decisions in order that every community worldwide can maintain sustainability through ecological balance.

Keywords: Global Populations, Policies, Metal Legacy, Toxicology, Environmental Health

Introduction

Environmental Justice has been defined as equal protection from environmental health hazards and equal access to governmental decision-making processes for people of all incomes and ethnic groups. More broadly, the concept of environmental justice includes redress of social inequalities related to: 1) the burden of environmental pollution, 2) unequal access to resources leading to reductions in health, and 3) quality of life without equity in sharing the benefits of industrial activity. In the USA, communities affected with toxic substances have included groups of low economic and political status such as indigenous tribes and people of color. The concepts of wildlife as a value for toxicology research [1] and sustainability have led to the inclusion of intergenerational ethics into environmental justice. The principles of justice, or equity, have figured prominently in public debates and the politics surrounding pollution, climate change, resource development and food security.

In general, exposure assessment of legacy toxins and risk management decisions are based on an analysis of

the weight of scientific evidence that leads to conclusions about the potential risks to health and the ecosystem [2]. Therefore, policy makers must include both economic and political concerns, as well as an evaluation of the uncertainty in the information, and the possibility of social stigma in any decisions. Many times, in politically charged issues, the rigorous science base is lacking and the policy makers cannot assume that social or political concerns are not without merit. Choices and tradeoffs will always be necessary when making any decision of significant consequences involving any complex ecological and social system because group values, perspectives and long term goals will vary. A committee of the National Academy of Sciences recommended that, "In instances in which the science is incomplete with respect to environmental health and justice issues, the committee urges policymakers to exercise caution on behalf of the affected communities, particularly those that have the least access to medical, political and economic resources" [3]. Environmental justice and ethics can provide support for arguments that a sustainable and resilient environment, with its diversity and complexity, has intrinsic value that is important to the well-being of future generations.

Today, scientific information is more widely distributed globally through international scientific journals based upon the local environments and communities involved. Furthermore, free democratic societies at the local, regional, national and international levels demand stakeholder participation in energy and material resource development and environmental conservation issues. The decision process has also become more open and subject to widespread political debate. While the arguments are environmental, economic and political in nature, the underlying issue in the debate is usually related to the toxin and ethical values, such as human rights, justice, benevolence and beneficence.

Health and Exposure to Chemical Pollution

Most issues in environmental justice are related to the health disparities within diverse groups of minority populations. These groups are either denied the use of resources or exposed to adverse impacts from chemical exposure. The basic disparity in these controversies relates to inequalities in the risk / benefit ratio experienced by social or economically disadvantaged populations. Alaska Natives and North American Indians, for example, have been the focus of concerns about exposure to environmental hazards through occupational risk, living conditions or food systems. For example, during the 1950's, uranium ore was discarded on the Navajo lands in New Mexico and Arizona with resultant dust detected in the homes of Navajo miners. Mining issues, related to radioactive and other metals, have been debated in Canada as the Canadian provincial and tribal governments considered uranium mining on Algonquin lands. In Alaska, gold and oil mining on both Native and state lands were hotly debated due to the potential impacts on fish and wildlife resources. These political debates, while local in nature, are centered on who controls use of the land, who benefits and who will be harmed.

Now, the justice issue is the health of the land; can the ecosystem itself survive? For example, when an excess of rain falls, flooding can occur in the environment, causing devastation to plants, food sources for animals, and human living conditions destroyed. Therefore, one must ask, is this organic release of rain from the atmosphere, from the ecosystem itself, or from manipulated cloud seeding that has been occurring since the 1960's and continues with further advancements in that area; since Earth has always been addressed as a metaphor of a live organism that has energy, growth and cyclic shifts in weather and its environments.

Currently we are entering a new cyclic phase of environmental shifts, where the impact of the human species can impact climate change. Natural events will occur and may suffer because of our human choices. Yet, if we become more responsible, then changes can occur for the survival of

a supportive environment. It is our level of conscious which we hold which influences the environment. In other words, we must take into account that the Earth now expands and releases its energies in response to our human consciousness. We need to become synchronized with the Earth's energy for environmental changes. Since this education may take a long time, what we need to do in the interim is to be mindful of the narratives of government agencies control of the environment, and this requires us as citizens to have a strong commitment to our communities in order to have a strong voice.

Political structures, such as state or provincial governments, often overlap on regulations leading to conflict with tribal, state or federal governments. The legacy of colonialism in North America, as differences in cultural values, relationships between people with the land and inter-generational ethics conflicts continue to remain a veiled context. History documents a process by which an advantaged group, having exhausted its sustainability options, dispossesses another group of its culture or lifestyle and traditional knowledge by economic, military, or government process. The potential outcome is a reduction in the innate ability of the resident group to mainstream their local environment. This increases the vulnerability of future generations to survive in the real world as their natural wealth is destroyed.

Establishing causal relations between a reduction in community health and well-being with chemical exposures form the siting of an environmental hazard such as a mine waste site or oil refinery, in a rural, minority or low-income community is politically complicated because of the modern definition of health and inherent uncertainty in the scientific process. The "perfect evidence" of causation is not only practically impossible to obtain in human populations because of the research expense and multiple confounders, but also because of important ethical restraints on controlled experimentation on human populations. On the other hand, industrial modification of the ecosystem could be considered an uncontrolled experiment.

Developmental defects from chemical exposures to variable mixtures often do not become apparent until adulthood, creating a lag time that prevents solid conclusions at decision. The current use of these concepts, "weight of evidence" and the "precautionary principle", that are used in addressing uncertainty and causation about toxic issues, are not always successful in the committees of government agencies.

In analyzing a suspected case of environmental justice, the U.S. National Academy of Sciences suggests that the proximity and characterization of exposure are key components [4]. Therefore, these two main questions should

be addressed:

- Were sites located because of discriminatory motivations, cheap land or lack of political power?
- Are the communities characterized by the same socioeconomic / ethnic indicators today as when the sites were originally developed?

Being able to quantify how the contaminants move through the environment and the actual human exposure (if possible) can add to the weight of the evidence for government agencies. This requires an affected community to have access to knowledge and understand of all the potential pathways and exposure of contaminants in their environment. Besides direct pathways such as air, drinking water and food sources, pathways related to differences in behavior, employment and lifestyles should also be identified and characterized. For example, unlike urban populations, rural Arctic communities have high intakes of subsistence foods (wildlife, berries and fish) [5]. In some locations, the levels of persistent organic pollutants, oil, mercury or other metals have caused concerns especially when the source is related to military legacy or resource development that provides little economic or other benefit. For urban populations, legacy lead (Pb) in apartment paint in government funded housing has been found to be a primary environmental toxicant.

In the past, blood toxin levels were consistently higher for poor and minority children in the central areas of cities. Many times scientific research has failed to demonstrate simple statistical support for causal certainty because of confounders such as parental bioaccumulation, risky behavior, differences in biomagnification and biases related to census tract data. Currently, prevention intervention studies have been suggested as a method to provide a link between exposures and health. Of course, removal of the contaminant that leads to reduction in the illness, is a key addition to the weight of evidence; but these studies are expensive and take many years. However, no matter how a particular health condition came to be, if it is an environmental hazard whose burdens are borne inequitably, then it must be mitigated.

Over the years, there has been an increased awareness for national agencies to move their focus from the lab to the field. By doing so, it refocused their research priorities up the organizational hierarchical scale, resulting in an increase of commitments for more research funding. This research funding should support innovative approaches by the research scientists to define levels of contaminants in defined ecosystems for both the humans and / or surrogate wildlife species. For example, communities and public housing with lead in their water pipes, as well as those that dump their wastes offshore or outside the city at the source of their aquifer are realizing the complexities of the toxicant scale; and, most often, after the damage has

already been done. Also, most importantly, monitoring the uptake of contaminants in both wild and commercial food sources, should be for all humans; and not dependent on age, income, ethnicity, or socio-economic status. We now know the value of the Precautionary Principle when it comes to environmental law, but it has not been a focus by many agency funding planners. Because general precautionary measures are usually not taken seriously, long term board pollution, research pollution and toxicology studies / surveys are often less competitive for funding.

In the Anthropocene, the Arctic and sub-Arctic will be especially vulnerable. It is especially critical here as the human population and associated resource development expands, overwhelming the environmental region's ability to provide a healthy recycling ecosystem service of supplying clean water and food. Consequently, an environmental justice system needs to focus not only on the health of people but also on the health of the ecosystems that support them; as the ecosystem is a victim of itself. All the Earth's organisms should be treated with respect, especially with regard to toxic contaminants.

Conclusion

All people should have access to the decision making processes on toxic hazard and risk management. In this way, every community worldwide can oversee and help to maintain their regional ecosystems in a state of ecological balance, especially during times of gradual changes through natural succession. It is particularly critical now, during the Anthropocene, as the Earth's human population expands and overwhelms the planet's carrying capacity, there is a greater need for the value of reforms and environmental justice movements.

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