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Review Article

Environmental Ethics Relevance to Public Health: Current Narratives and Implications for Policy

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Abstract

The poor state of environment can affect human health and maintaining a perfect environment requires considerable investment in staff, resources, good communication, willingness to dialogue and be flexible and listening on both side of the table. It is well known that the promotion of human health can also affect the environment. This cause harm to the environment, such as the increased use of fossil fuel, deforestation, pollution and biodiversity reduction. The relationship between the environment and human health creates complex ethical issues related to environmental regulations and health policy decisions. These ethical issues are aimed at increasing and generating emergence of environmental impacts of climate change and new technologies that can affect the environment, such as nanotechnology, genetically modified organisms and biofuels. While, government need to focus on educating its citizen about the importance of environmental health ethic. Promotion and education have proven to be a major contributor to the success of environmental health ethics and is a key to ensuring ethics sustainability.

Keywords: *Ethics; Sustainability; Human Health; Environmental Harm; Good Communication*

Introduction

While skeptics may scoff, ardent followers believe a palm reader can examine your hand and reveal personal characteristics. But on any given day, an observation of your local community says a lot about our global society at large. Globally, environmental health ethics has been an important issue which has been studied in the academic area and this has led to the creation and improvement in policies standards and public awareness programs. Environmental Health Ethics reflects the conflicts between the protection of the environment

and the promotion of human health. It is interesting to note that the Earth has entered a new epoch, the Anthropocene, where human activity has dragged on and will continue to bring about significant changes in planetary biophysics of our globe [1,2]. Scientists warn that Earth systems and processes critical to supporting life may be approaching or have already crossed critical thresholds or tipping points [3,4] that may cause ecological and social systems to undergo abrupt, surprising change [5]. While the limit of social systems to cope with these changes have become evident particularly with regard to managing global consumption and conservation of natural resources, new configurations of environmental and governance ethics have come into being with the explicit purpose of avoiding the consequences of unpredictable and sudden change and adapting to new environmental conditions [6]. However, mitigation and adaptation may not be sufficient to ensure that nested social-ecological systems (SESs) are not integrated beyond the Earth's sustainable limits of biosphere [7,8]. In short, it is possible for the Earth to change faster for society to mitigate or adapt, and regime shifts are expected. This is why society is faced with a choice: to passively consider or attempt to control these expected changes or attempt to manage them so that the outcomes are more likely to support human and planetary welfare. Issues concerning society concern everyone. Therefore, there are individuals, groups of small or large, formal or informal entities, public or private firms, governmental or development partners such as non-governmental organisations who are key stakeholders of society must always aspire to champion societal concerns. Society's welfare should be everybody's business.

The ways societies are organized contribute to the health of people in numerous ways. By producing highways, factories, nature parks, airports, cycling paths and elevators, society promotes the health of individuals or harms intentionally or unintentionally. Of course, these societal factors go hand-in-hand with physical factors, such as volcanoes, weather, soil characteristics on which crops are planted. All these factors contribute to the well-being of environment and unhealthy individuals. The philosophy of environmental health is inspired by the great work of ethics, that is, we must first examine the presuppositions and consequences of actions with respect to the interests and wellbeing of living beings; second, what is the best desirable distribution of benefits and losses between individuals and groups; and last but not least, what are the opportunities of living in relation to the values individual have that represent a good life to a large number of people [9]. Taking these considerations into account, we can discern at least four major types of ethical manifestations into complex relationship between environmental factors and human health. The first concerns the identification of what environmental factors that are considered to be problematic (and what is the nature of the problem) in causing unhealthy consequences, and where the environmental causes can be located. Second, there are many ethical problems with policy issues related to the study of environmental factors that determine the potential risks to human health: e.g. what is the best, ringing alarm bells or keeping silent about the problem? Third, the responsibility of the authorities including agencies and parastatals involved is always at stake and often contested; and fourth, these agencies assume the right to intervene to reduce unhealthy conditions; moreover, the methods of intervention themselves requires ethical attention.

First, the identification of problematic adverse effects of the environmental factors and human health must be taken into account when solving ethical problems. It is often difficult to identify and document the manifestations to potentially hazardous substances and processes, not only because of the complexity of their relationship with their long-term risks, but also because individuals involved can experience differing susceptibilities to their harmful effects [10,11]. This complexity means that research is quite expensive and often controversial in all these interwoven factors. Are society willing to pay for this and are they prioritising this problem than others [12].

In addition, uninitiated persons can often see a direct link between the location of the toxic waste site and the residences near such sites; or between highways and a higher occurrence of asthma, for example. Many believe that when street restaurants or eateries such as Kilimanjaro, Royals, Chicken Republic, Tantalizers, Vicent, Mr. Bigg, Crunches and others are tolerated not only in cities, but also in mass media advertising and sponsorship, it should not be surprising that the numbers of obese persons are constantly increasing, as they still are in emerging countries such as Nigeria, along with increased instances of concomitant diseases, such as type-two diabetes, cancer of the intestines and cardiovascular diseases. However, one of the strongest food industries, for example, Kilimanjaro and Crunches, thinks

the opposite and acts accordingly. Thirdly, environmental health risks are not equally distributed for the most part, so that rich people tend to live in healthier environments than poor people. These three different factors challenge us with the ethical question of justification to identify the adverse environmental effects and the corresponding choice of research topics and research trajectories. Should research and policies begin with the most difficult cases or on the cases that are easier to deal with? What power play is involved in problems solving? Should priority be given to the environmental health problems of the poor and powerless [10,13].

Secondly, research and policy measures related to environmental factors that are thought to be responsible for the decline in public health are facing new ethical relevant problems. When scientists identify environmental toxicants like dioxin in landfills and step up research about their effects, ethics evolve because the decision to pursue research in specific areas can interfere with power relations, people's concerns about safety and other expectations. In addition, research and policy measures can encourage the use of animals for experimental purposes, which is problematic from an animal ethics point of view.

Thirdly, the burden of different individuals and organizations on the adverse environmental effects on human health are at stake [14,15]. How many people are held responsible and can such actions from an ethical point of view, be prevented in one way or another from repeating similar actions that contribute to those adverse effects? Similarly, new ethical questions are raised by the kind of interventions to be carried out after research has identified the adverse effects and investigated the actual health effects on health. It is possible to distinguish between the most personal types of intervention and other collective social regulations, as well as between more expert or social based intervention [10,11]. Estimating the cost on the basis of value perspectives do play an important role here and identifying low-risk populations can lead to a discriminating behaviour when taking ineffective precautions, a question which is related with the issue of responsibility.

Ethical problems in environmental health

Recent cases of environmental health are clearly evident in many of these four types of ethical issues. The famous case began in 1978 at Love Canal, a suburban town in the state of New York that was built over the waste-disposal site of a former chemical plant. Citizens suffered a variety of health problems such as asthma and urinary tract infections, due to the presence of many toxic substances, some of which were carcinogenic, mutagenic and teratogenic. Government scientists have made many mistakes in identifying the exact causes of the health problems that these citizens had and resisted the data and findings of citizen activists. Even a Hollywood movie (A Civil Action) was made on such events [16]. The exact identification of the problem was at stake here and was determined from a variety of normative backgrounds, including most conservative opinion that a place is safe until it is proven otherwise, or the contrary taxonomy that a place is dangerous until it is proved otherwise. The type of research to be carried out and the policy measures related to these research efforts were also controversial and value laden. Government scientists researched the locations near to the waste-disposal site; however, the citizen activists analysed the locations near old drainage ditches. Different estimations of carcinogenic effects have been made, and the results of uncertainty are a good excuse for some of the participants to do as little as possible. It has been questioned about the responsibility of the owners of the former factory addressed, as well as the government and their scientists. Communication of the research results has caused quite a lot of consternation. Eventually, intervening in the process of the property structure of what some consider to be seen as an infringement, and by others as necessary activity inspired by more basic values. However, there are many other cases in which environmental health risks are at stake, resulting in attempts for example to identify people as severely toxic, and eliminate them from childhood illnesses; or to linking cases of cancer or asthma to the proximity of industries. In most cases, environmental justice activists have made significant contributions in shaping these problems formulated and the efforts of researchers and policymakers. Exposure of environmental toxicants into context involves multiple ethical choices [10].

The establishment of research agendas achieves ethical outcomes; identification of a problem that is up against a balance of power and entrenched positions often poses many difficulties. Secondly, inaccurate data due to their complexity and dynamics often lead to

different interpretations and contradictions among rival groups. Data can be interpreted in multiple ways, according to the theoretical assumptions and normative perspectives. Sometimes, you get an answer using a thorough research, which usually means that more animal testing is required and needed. New types of research also challenge traditional research methods, applications and practices. For example, genomics (scientific research on the relationship between genes and their environment) can play an important role in improving research in environmental health [17-19]. Genomics may contribute to the light of genetic predispositions, which mean that some groups of people are at higher risk of certain environmental health problems than other groups. Some lifestyles are more vulnerable to adverse environmental influences on health than others [20]. In such contexts, screening and testing involve important ethical decisions, because they often discriminate against the selected group; however, they also offer new opportunities for new professions and allocations of responsibilities [15]. Controversies over how interactions with affected people do influence their reactions. There are strategies that eliminate the right to intervene in unhealthy practices and to impede certain practitioners, creating a new ethical questions. There are often three types of paternalism: hard paternalism, soft paternalism and maternalism [21,22]. The first type includes the direct coercion and denies autonomy of the option, the second involves the cancellation of certain options for action; or less drastic, offering inaccurate information (such as 'smoking kills'). Maternalism implies psychological control by addressing moral feelings such as guilt. There is often a mix of two or three to implement the strategy. For example, with respect to obesity, some types of unhealthy food can be made more expensive (soft paternalism) or some persons may be prevented from purchasing fatty foods (hard paternalism). However, ethical considerations, such as independence, the right to make decisions about one's life, and the cost benefit analysis or utilitarian arguments, play a role here [9]. Improving environmental health requires attributing accountability to individual, institutions, networks and policy agents, often related to power and interests [14]. Responsibilities of different stakeholders are at stake: when environmental health effects are severe, we tend to blame others or by referring to the complexity of the issue by raising the problem of 'many hands' (a situation where so many people are involved that it is impossible to trace back to individual actors or groups what their responsibility are discussed below [23].

Framing analysis: current narratives and ethical issues

Many of the most challenging ethical questions of the fourth industrial revolution of our time are about the interactions between human health and the environment. How should pesticides, industrial chemicals and pollutants be regulated? Do we need to develop genetically modified organisms for use in agriculture, medicine and energy production? How should they be regulated? Should we use genetically modified mosquitos to control mosquito-borne illnesses such as malaria and zika virus? How should we guarantee our food security? What steps should be taken to reduce antibiotic resistance? Where should a community set up a new solid waste facility? Where should a nation locate its hazardous or radioactive waste? What measures must be taken to protect people from workplace hazards? Should workplace safety measures be specifically designed for pregnant or fertile women? How do you reconcile the safety and affordability of building standards? Should people be prohibited to build houses in flood-prone areas? What steps need to be taken to reduce or adapt to climate change? Should richer nations bear more of the responsibility than poorer countries? How should we regulate energy production and use to protect the environment and human health? Should measures be taken to promote democratic participation in environmental health decision making? The issues that arise in environmental health ethics are often complex, interdisciplinary, dynamic and global in scope. Finding satisfactory solutions to environmental health problems will become increasingly important as the environmental impacts of human activities continue to increases as we learn more about the relationship between human health and the environment.

The science: Environmental health and hazards

All organisms depend on their milieu to obtain energy and materials needed to sustain life. Clean air, potable water, nutritious food and safe place to live. For most of the history of mankind, increases in longevity were due to better access to these necessities. Advances in agriculture, sanitation [24-30], water treatment and hygiene have had a much greater impact on human health as medical technology. Although the environment sustains human life, it can also cause illness. The lack of basic necessities is a major cause of human death.

Environmental hazards increase the risk of cancer, heart diseases, asthma and many other illnesses. These hazards can be physical such as pollution, toxic chemicals and food contaminants or social such as hazardous work, poor housing conditions, urban sprawl and poverty [24-28]. Unsafe drinking water and poor sanitation and hygiene are responsible for a variety of infectious diseases such as schistosomiasis, diarrhea, cholera, meningitis and gastritis [29-31]. In 2015, an estimated 3,500,000 children under age 5 (mostly in emerging countries) died from diarrheal diseases related to unsafe drinking water and approximately 1.8 billion people used drinking water contaminated with faces. More than 2 billion people do not have access to basic sanitation. Examples of environmental related illnesses include: Cancer, heart diseases, diabetes, asthma, obesity, arthritis, malaria, depression, dysentery, Parkinson disease, occupational injuries, chronic obstructive pulmonary diseases etc [24-31].

By contrast, activities that promote health and improve human life can have negative adverse environmental effects. For example, food production causes environmental damages due to pesticides and fertilizers, soil salinization, waste produced by livestock, carbon emissions from food manufacturing and transportation, deforestation and overfishing [24-28,32,33]. Health care facilities also have negative adverse environmental impacts. Hospitals use large quantities of electricity and fossil fuels that lead to medical wastes. To prevent certain diseases, it may be necessary to damage the environment. For examples, malaria was eradicated in some developed nations in the 1940s and 50s as a result of draining wetlands and application of DDT to kill mosquitoes. Reducing mortality from starvation or disease can lead to over population, which stresses the environment in many ways, such as increased use of fossil fuels, clearing of land, generating pollution and waste, etc.

Bioethical, social and legal considerations

Relationship between human health and the environment raise many ethical, social and legal dilemmas by forcing people to choose among competing values. These considerations can be grouped into the following categories.

Managing benefits and risks: Many of the issues at the intersection of health and the environment have to do with managing benefits and risks. For examples, pesticides play an important role in increasing crop yields, but they can also pose hazards to human health and the environment. Alternatives to pesticides use create trade-off in health. The extreme action of stopping all pesticides uses could significantly reduce agricultural productivity, leading to food shortages and increased food prices, which would in turn, increase starvation in emerging countries. Public health authorities have opted to regulate the use of pesticides to enhance food production while minimizing damage to the environment and human health. Energy production and use helps sustain human life, but it can also pose hazards to human health and the environment such as air and water pollution [29,30,34-36], oil spills and destruction of habitats [36]. No issues demand greater care in balancing benefits and risks than global warming [24-28]. A significant percentage of global climate change is due to the human production of greenhouse gases [24-28,37].

Climate change is likely to cause tremendous harm to the environment and human health but taking steps to drastically reduce greenhouse gases could have adverse consequences for global, national and local economies, which would result in a general decline in human health and health care. For example, greatly increasing taxes on fossil fuels would encourage greater fuel efficiency and lower carbon dioxide emissions, but it would also increase the prises of transportation and would lead to widespread inflation and reduced consumer spending power.

In addition, for many years some politicians and scholars argued that we should wait for more evidence of global warming before taking action, since the steps needed to prevent or minimise it could have disastrous economic consequences. Others have argued that society cannot afford to wait for complete evidence because the consequence of global climate change could be catastrophic and irreversible. This difference of opinion raises fundamental questions about the ethics of risk management: what is the role of scientific evidence in decision making? Should we use risk/benefit or precautionary decision making to develop environmental health policies?

Most regulatory agencies in emerging countries makes benefit/risk decisions based on information from scientific studies, such as chemical analysis, cell studies, animal experiments and controlled clinical trials. Agencies often refrain from making regulatory decisions until they have complete scientific evidence. Many commentators and organisations have endorsed an alternative approach called the precautionary principle. The idea is that society should take reasonable steps to prevent or minimize irreversible and significant harm, even when scientific evidence is incomplete and that regulatory decision to avoid harm need not await the accumulation of complete scientific evidence. Although the precautionary principle has gained many adherents especially in Developed countries, it remains controversial.

Social justice: Managing benefits and risks raises social justice concerns. In general, people with lower socio-economic status have greater exposure to certain detrimental environmental conditions in their houses or at work such as lead, mercury, pesticides, toxic chemicals or air and water pollution [29,30,32-35,38]. Communities and nations should minimise such injustices when making decisions such as choosing a site for a factory, a power plant or waste dump or regulating safety in the workplace. The decision-making process should be fair, open and democratic, so that people who will be affected by environmental risks have a voice in these deliberations and can make their concerns known. When drafting and implementing environmental health regulations, it is important to consider vulnerable subpopulations. A vulnerable sub-population is a group with an increased susceptibility to the adverse effects of an environmental risk factor, due to their age, genetics, health status or some other conditions for example, children are more susceptible to the effects of lead, mercury and some pesticides than adults. Some people have a genetic mutation that increase their susceptibility to cancer caused by passive smoking. If an environmental regulation is designed to protect average members of the population it may fail to adequately protect vulnerable subpopulations. Justice demands that we take care of people who are vulnerable. However, almost everyone in the population has an above average susceptibility to at least one environmental risk factor. Since providing extra protection to everyone would be costly and impractical, protections must be meted out carefully and the populations who are vulnerable to a particular environmental risk factors must be defined clearly. For example, about 0.4% of the US population has a severe allergic reaction to peanuts. Banning the sale of peanuts would be a costly and impractical way of protecting people with peanut allergies but requiring that products containing peanuts be labelled clearly would be reasonable.

Some justice must be a factor in allocating resources for health care. Governments spend billions of dollars trying to improve the health of citizens and prevent disease. These funds go to biomedical research, over seeing the safety of foods and drugs, enforcing environmental or occupational health regulations and running programme for disaster preparedness, public health, health education, sanitation, water treatment, but one might argue that it would be wiser to shift some resources to disease prevention programs such as environmental protection, public health and health education, since prevention is generally more cost effective than treatment [24-28].

Human rights: Various public health strategies put the rights of individuals against the good of society, such as mandatory treatment, vaccination or diagnostic testing; isolation and quarantine and disease surveillance [24-28]. The main argument for these public health strategies is that individual human right may have to be limited to prevent the transmission of infectious diseases, such as tuberculosis, SARS, HIV/AIDS, Pneumonia [39]. But restrictions on rights should be well thought out and safeguards put in place to prevent public health authorities from overstepping their bounds. Protecting the public health should not come at the expense of human rights. Some health and environmental protections also limit property rights. The owner of a coal burning power plant must deal with many laws concerning the operation of the plant, workplace safety and carbon emissions. A developer who plans to build 150 new houses with land he has purchased may also have to deal with laws concerning storm drainage water and sewage lines, gas lines, side walks and so on. Restrictions on property rights are justified to protect human health and the environment. But opponents of these restrictions argue that they are often excessive or not adequately supported by scientific evidence.

Human rights issues also come up in research on environmental health that involves human subjects for such research to be ethical, human subjects must give consent and great care must be taken to ensure that they understand that they can opt out of the research

project. Since the 1990s. Some pesticides companies have tested pesticides on human subjects to gather data to submit to the government for regulatory purposes. Some commentators change that these experiments are unethical because they place people at unacceptably high risk without a clear benefit to society. Others have argued that the experiments, if properly designed and implemented, could produce important benefits to society by providing useful knowledge about the effects of pesticides which could lead to stronger regulations.

Emerging issues

There are many new developments is science, technology and industry that are sure to bring benefits and risk to the environment and human health. These include the development of nanotechnology, genetic modification of plants and animals, antibiotic resistance, threat to food security and the growing market for biofuels, among other challenges persist including the environmental conservation [24-28] and endangered species and questions about animal experimentation. Many more developments are likely to emerge. To guide them in a responsible way, we must continue in research to explore the relationship between human health and the environment and conduct fair and democratic public consultation such as public forums, academic conference and legislative debates, which is attended by participants with diverse cultural, socioeconomic, philosophic and scientific perspectives [40].

Conclusion

Once identified and diagnosed, many environmental health problems are extremely complex and difficult to tackle, whether in research, or in policy measures or in communication. From an ethical/philosophical point of view at least four issues related to environmental factors deserve ethical attention. First, identify what type of environmental problem is the cause of the disease and where the problem lies. Secondly, there is the ethics of doing research into the factors that produce environmental risks. Third, responsibility for managing and improving the environmental health of the various practitioners involved and in need of ethical attention. Fourth, the right to intervene to reduce unhealthy factors and the nature of the intervention requires ethical analysis. With these four types of problems, it is not the case that ethicists have a ready-to-use toolbox. However, advocates of ethics, in collaboration with social and communication scientists, contribute to an ethical analysis of the issues where it really impacts, and try to offer proposals to reduce ethical/philosophical damage as much as possible. These contributions call for more transparent role for interdisciplinary ethicists in government and science circles that focus on environmental health. But there is also a growing body of research on the different ethical methods and the extent to which they can improve the ethical status of many complex and multifactorial problems that are so prototypical for problems of environmental health and the concept of continuous improvement which the public places in our hands the responsibility for managing the environment and if left untended, could seriously compromise health, safety and quality of life.

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