Online Ethics Center
FOR ENGINEERING AND SCIENCE

Case: Biodiversity and Human Health

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Description

A scientist working for an environmental advocacy group in Indonesia fights against the transfer of a portion of state owned native forest to a palm-oil plantation. The case raises ethical issues including how to establish the value of natural lands, environmental justice, and communicating science.

Abstract

This biodiversity case is part of a larger collection of Life and Environmental Science ethics education resource sets on ethics of emerging biotechnologies, big data in the life sciences, human enhancement, and biodiversity. Doctoral students from Arizona State University's Center for Biology and Society developed the resources under the direction of Karin Ellison and Joseph Herkert between 2014 and 2019.

Body

The archipelago country of Indonesia contains one of the world's twenty-five "biodiversity hotspots" (Myers et al. 2000). Such "hotspots" are locations on the planet that are home to exceptional concentrations of variety of life, particularly in terms of endemic species. Indonesia is also home to a large and growing population

of over 250 million people living at a density of 142 people per square kilometer (World Bank 2016). (For comparison, almost 320 million people live in the United States at a density of 35 people per square kilometer.) To meet the economic and social demands of a dense, large, and growing population, some areas of the Indonesian islands have been developed for urban, industrial, and agricultural uses. Unfortunately, such development is sometimes in close proximity to and threatens destruction of the ecosystems that constitute Indonesia's biodiversity hotspot.

Kiera—a recent PhD graduate of a large university in the United States—has returned to the Indonesian island, Sumatra, where she was born and raised to work for a local chapter of an NGO, Friends of the Earth International. In Sumatra, Friends of the Earth and Kiera are fighting against the transfer of a portion of state owned native forest to a palm-oil plantation. Past efforts to halt plantation expansion relied on emphasizing the spiritual and intrinsic (existence) value of the biodiversity in the forest. Plantation owners, employees, and some local villagers argued that the plantation harbors economic benefits that outweigh the non-monetary value of the intact ecosystem.

Although agriculture will bring short-term economic benefits to the community, the long-term costs of lost biodiversity may be severe. Recently, Kiera learned that destruction of biodiversity could have human health implications. In particular, recent studies have shown that decreasing levels of biodiversity may lead to an increase in outbreaks of vector-borne and parasitic diseases, such as malaria, dengue, zika, and schistosomiasis (all occurring in Indonesia) (Bonds et al. 2012; Morand et al. 2014; Keesing and Ostfield 2015). Outbreaks may necessitate a costly healthcare response. In addition, there are studies linking disease outbreaks to poverty (Garchitorena et al. 2015; Bonds et al. 2010; Bloom and Canning 2000).

Furthermore, the endangerment of local lives due to nearby environmental degradation could be considered a violation of environmental justice (the fair treatment of all people with respect to environmental laws, policies, and regulations).

Due to the potential public health costs and environmental justice violation there will be a public vote regarding expansion of the plantation (a democratic decision process in an only recently democratic nation). In advance of the vote, Kiera's organization has charged her with putting together a public education forum. However, some of the evidence for disease outbreaks in response to declining

biodiversity is conflicting. Kiera has decided to focus on the academic literature and media that claim biodiversity destruction is likely to lead to disease outbreaks. This way, she believes she is more likely to persuade locals who will feel they are endangered by palm plantation expansion. Perhaps she will initiate a local environmental justice movement.

Discussion Questions:

1. Should Kiera use the evidence of biodiversity's relationship to human health to argue that biodiversity should be protected? Why or why not?
2. How should Kiera deal with the presence of conflicting conclusions in the literature? Should Kiera present both sides of the scientific debate? Why or why not? How can she communicate scientific uncertainty to plantation developers and local citizens?
3. What are the strengths and weaknesses of an economic value vs. intrinsic value argument for biodiversity protection? Which argument do you think will have more sway with plantation developers and government regulators? Why?
4. Given possible human health implications of biodiversity loss, do you think that protecting and maintaining biodiversity is necessary to achieve environmental justice? Why or why not?
5. How could increasing public participation in environmental decisions lead to more environmentally just outcomes? What do you think would be the outcome of a public debate in this case?

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Links:

World Health Organization:
http://www.who.int/en/

Convention on Biological Diversity:
https://www.cbd.int/health/

Notes

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Resource Type

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