

Environmental Ethics: a Scenario-Based Approach

The treatment of environmental ethics in an undergraduate programme depends heavily on context. Is this an environmental science or bioscience programme? If bioscience, is it broadly in the molecular or biomedical or ecology area? My experience is from a Scottish University, where our four-year degree includes a general biology course at first year before students specialise. We introduce bioethics broadly in first year then provide more programme-specific treatments at higher levels. Although we offer a five-week final year option in bioethics, this is taken only by a small number of students. For most, exposure to relevant aspects of bioethics is embedded in their degree. I feel this is optimal for bioscience students, who are not likely to be very interested in the finer aspects of moral philosophy, but who are interested in grappling with the ethical problems inherent in their subjects.

We provide all bioscience students with a brief introduction to ethical decision-making, and most also cover the extension of ethical concern from humans to animals, in the context of animal experimentation, zoos, farm and domestic animals. But environmental ethics potentially takes this concern further: do we have the same duty of care towards wild animals as to our pets? And is it legitimate to think of a duty of care towards plants, and the environment as a whole?

Our main teaching method is to present students with a set of short practical scenarios, summarising real problems in environmental management, and including both scientific and ethical aspects. Students discuss the problems in small groups and then report their findings back to the whole class in a series of short presentations. Their discussions and preparation periods are usually time-constrained, which helps to concentrate minds. Depending on the time available there may be back-up reading for the students to digest (either during the class or in advance) or the problem may be adequately described in the short scenario.

Here are some examples of problems we have used:

- **Malaria control: Should we ban the use of DDT? Will genetic modification of mosquitoes provide a safe control method?** To understand this problem, students need to grasp many aspects of malaria: the parasite and its vector; pathology; health and economic effects; costs and benefits of different control strategies; evolution of drug and pesticide resistance. At first, students tend to think of the problem simply in terms of effectiveness: if DDT is cheap and effective, use it. But when we ask them to identify the ethical issues, they soon see this as a classic utilitarian case with the benefit being disease reduction and the costs being to the environment and human health as side effects. Further, there are issues of power and autonomy: who decides whether DDT is used in an African village? Genetic modification brings other questions: is it right and how could we test its safety as well as its effectiveness? In this case, environmental ethical issues are embedded in a complex scientific problem, along with other ethical aspects.

- **Why should we conserve wildlife?** This is a fundamental question for conservationists: if they cannot provide compelling answers, they are likely to lose most arguments against developers. We ask groups of students to brainstorm as many answers as they can think of, and then to rank them. Most students soon realise there are several different sorts of argument for wildlife conservation. For example, wildlife can provide humans with benefits, which would be costly to obtain in other ways – an essentially utilitarian argument. Alternatively, we may consider wildlife has a right to existence, a deontological argument. Ranking such arguments and then comparing with other groups helps students see that not all people will be similarly convinced by particular arguments.
- **The rights of native peoples in areas of high biodiversity.** A wildlife conservation organisation has purchased a large area of Amazonian rainforest, and intends to turn it into a wildlife reserve, devoid of human presence. Unfortunately, the area has long been home to a tribe of Amerindians, who have a subsistence way of life. Some wild species endemic to the area are vital to the way of life of the Amerindians: frogs for toxins to arm their arrows; birds feathers in ritual ornaments. Some of these species are becoming rare as a result of collectors from outside the area, involved in the wildlife trade. Students outline and discuss the ethical issues related to the wildlife conservation organisation's plans.
- **Environmental ethics of renewable energy.** In attempting to deal with climate change, judged to be the result of anthropogenic increases in atmospheric greenhouse gases, there is a move to non-fossil-fuel based energy sources. Major candidates are nuclear energy and a range of 'renewables' (varying with climate and country), such as hydropower, wind, waves, tidal, geothermal and solar. As with fossil fuels, these alternatives all have costs and benefits. For example, hydropower and wind energy collection both have controversial effects on landscape quality; wildlife conservationists are particularly anxious about lethal effects of windfarms on birds. Students attempt a cost-benefit analysis of a major shift from fossil fuels to non-nuclear renewables.

I've provided a selection of the cases we have used in this way: others are alien species, re-wilding Scotland (restoring populations of locally extinct animals) hunting and conservation, elephant conservation in Southern Africa, the ethics of 'triage' – and I'm sure readers can think of other examples. All concern practical cases where science and ethics are intertwined, and students can learn through discussion amongst themselves.

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