

The challenges of environmental education

Charles suggests that it is essential to adopt a questioning and critical approach to teaching environmental geography, and proposes key questions for teachers to ask themselves.

Environmental education is central to geography. Indeed, teaching about the environment provides geographers with a perfect opportunity to develop holistic geographies by integrating human activities with the physical environment (Rawding, 2013a, 2013b). However, teaching about the environment is also extremely challenging. This article asks a number of questions about how we might approach teaching environmental geographies in an effective manner.

Are environmental geographies too simplistic?

Figure 1 is a description of a place in the Chernobyl region, somewhere generally portrayed as being a total environmental disaster, yet a quick Google image search shows a city rapidly reverting to woodland. Indeed, as the quote suggests, despite the massive damage to the environment caused by people their subsequent departure from the area has aided biodiversity!

Environmental issues are complex and multi-faceted (and therefore intellectually interesting). For instance, some landscapes are more likely to be affected by climate change than others – where they are close to important thresholds (such as melting ice) or where the climate is predicted to change more rapidly (so-called ‘geomorphological hotspots’). Equally, sea-level rise may be being exacerbated by falling land

levels due to the removal of groundwater or mineral extraction (e.g. the Mississippi delta) (Goudie and Viles, 2010, pp. 86–92).

The complexities of the environment can be used effectively in teaching where exemplars illustrating unintended consequences can highlight both complexity and the interconnected nature of environments and ecosystems. For instance, in the 1950s malaria was a problem in Borneo, so the World Health Organisation sprayed with DDT. As a result the mosquitoes died and malaria declined. But people’s houses began to collapse, because the DDT had killed the tiny parasitic wasps that had previously controlled the thach-eating caterpillars. So the government issued tin roofs, under which people couldn’t sleep when it rained! Meanwhile the DDT-poisoned bugs were being eaten by geckoes, which were eaten by cats. So the DDT built up in the food chain and began to kill the cats. Without the cats, the rats multiplied, threatening typhus and sylvatic plague (Hawken et al., 2000, pp. 285–6).

It is equally important to acknowledge the role of social, economic and political structures when considering the environment. In the case of African wildlife, for instance, ‘the migration of the wildebeest, and its concomitant implications for grasslands and lions ... does not occur outside the influences of a broader political economy. Land tenure laws, which set the terms for land conversion and cash cropping, are made by the Kenyan and Tanzanian states. Commodity markets, which determine prices for Kenyan products and the ever-decreasing margins that drive decisions to cut trees or plant crops, are set on global markets. Money and pressure for wildlife enclosure, which fund the removal of native populations from the land, continue to come largely from multilateral institutions and first-world environmentalists’ (Robbins, 2012, p. 13). This raises a series of questions about the relationship between capitalism and the environment.

Indeed, it is impossible to understand contemporary geographies without discussing capitalism, yet developing a realistic framework in the context of school geographies is difficult. Hawken et al. (2000, p. 4) identify four types of capital:

- human capital, in the form of labour, intelligence, culture and organisation
- financial capital, consisting of cash, investments, and monetary instruments
- manufactured capital, including infrastructure, machines, tools and factories
- natural capital, made up of resources, living systems, and ecosystem services.

It is this fourth category which is fundamental to an understanding of environmental geographies

Figure 1: Extract from Chernobyl, *My Primeval, Teeming, Irradiated Eden* by Henry Shukman (2011). Source: www.outsideonline.com/outdoor-adventure/science/Chernobyl--My-Primeval--Teeming--Irradiated-Eden.html

The wild boar is standing 30 or 40 yards away, at the bottom of a grassy bank, staring right at me ... it's far bigger than I expected, maybe chest-high to a man. When it trots away, it moves powerfully, smoothly, on spindly, graceful legs twice as long as a pig's, and vanishes into the trees.

We meander along the sleepy brown river. Occasionally the wind picks up, flicks a ripple along the surface. This must be what life was like 1000 years ago, when the entire human population of the globe was roughly 250 million. There's space for everyone, time for everything.

On our way down off the bridge, we spot a slender roe deer 200 yards up the road. A little farther on, we spot an elk between two bushes. He looks at us, head lifted, then strolls out of sight.

Today there are around 5000 adult wild boars in the Chernobyl Zone ... There are 25 to 30 wolf packs, a total of maybe 180 adults. Many more lynx live here than before, along with foxes ... hundreds of red deer, and thousands of roe deer and elk ... a paradise of wildlife. The Garden of Eden is regenerating.

and which raises the question of whether we spend enough time in geography lessons on natural capital as an integrated part of capitalism.

The study of ecosystem services is a common requirement at GCSE, but there is less emphasis at key stage 3. Ecosystem services are the functions provided by ecosystems that are of major importance to human well-being. The Millennium Ecosystem Assessment (www.millenniumassessment.org) describes four categories of ecosystem services:

- supporting: such as nutrient cycling, soil formation and primary production
- provisioning: such as the production of food, fresh water, materials or fuel
- regulating: including climate and flood regulation, water purification, pollination and pest control
- cultural: including aesthetic, spiritual, educational and recreational services.

The previous discussion has demonstrated how complex environmental geographies can be. We can now turn our attention to another question raised by the near-universal portrayal of Chernobyl in negative terms.

Are environmental geographies too negative?

David Harvey (1996, p. 177) quotes Jonathan Porritt as stating that the aim of many ecological and environmental movements seems to be: 'nothing less than a non-violent revolution to overthrow our whole polluting, plundering and materialistic industrial society and, in its place, to create a new economic and social order which will allow human beings to live in harmony with the planet.' If the teacher presents such a one-sided view of environmental issues in the classroom there is a danger of undermining the credibility of the entire subject.

Elements of modern life may have undesirable environmental consequences, but at the same time, societal advances have been hugely beneficial. Re-framing environmental issues has the potential to avoid an overly-negative perspective. For instance, urbanisation concentrates humanity within a relatively small area of the Earth's surface, thereby minimising our impact on the planet. Shops and other services are more concentrated and urban dwellers are likely to have a lower carbon footprint than suburban and rural dwellers (Figure 2). At the same time, rural depopulation around the world is leading to forest regrowth in abandoned countryside.

Similarly, there can be an assumption that the development of transport infrastructure is bad for the planet, yet the entire world economy depends on the movement of people and goods. Transport developments can also have unexpectedly beneficial environmental consequences: for instance, the development of habitats for salt-tolerant plants along roadside verges, and the creation of wildlife havens in inaccessible areas of motorway junctions. At the same time, there is plenty of evidence of animal adaptations to human



Figure 2: Urban dwellers are likely to have a lower carbon footprint than rural dwellers as services are more concentrated.
Photo: Ruth Totterdell.

intrusions, such as the example of birthing female moose using visitors to Yellowstone National Park as human shields by choosing calving grounds near roads, which traffic-averse predatory brown bears avoid (Lynas, 2012, p. 112).

To condemn economic growth as unsustainable and undesirable runs the risk of presenting geography as a reactionary subject, not least because the alternative to economic growth is contraction, unemployment and political instability.

My third question is also related to seeing environmental issues through a negative lens.

Are Green geographies too doom-laden?

In 2009 the now-defunct QCDA stated: 'Most experts agree that our current mode and rate of development on Earth is not sustainable. The way we are living is over-taxing the planet's supply of natural resources – from fresh water supplies to fish stocks, from fertile land to clean air.' (QCDA, 2009, cited in Morgan, 2011, p. 9.)

However, an uncritical adherence to such an orthodoxy will result in negative geographies. Many approaches seen through this lens seem to be based on austerity measures – colder houses, fewer journeys, holidaying at home. Such an approach removes the geography altogether by focusing on reducing the use of resources (turning off the tap when cleaning teeth, recycling etc.) At the same time, if we are to inspire students to want to protect the world, surely it is important to offer a more positive vision?

A more balanced consideration of capitalism might help in this context. For instance, as Robbins (2010, p. 17) states: 'even if petroleum becomes scarce, the rising price per barrel will encourage the use of otherwise expensive alternatives like wind and solar power, or simply cause consumers to drive less, endlessly stretching the world's energy supply. While such optimistic prognoses are themselves fraught with problems, they do point to an important and increasingly well-accepted truism: resources are constructed rather than given.'

Over-simplistic, doom-laden, environmental geographies can be effectively countered by 'good' news. Figure 3 shows two contrasting views of human impacts and development. The problem is that both are true; another reason for a greater understanding of complexity.

Doom and gloom	Good news
'Forests are shrinking, water tables are falling, soils are eroding, wetlands are disappearing, fisheries are collapsing, rangelands are deteriorating, rivers are running dry, temperatures are rising, coral reefs are dying and plant and animal species are disappearing.'	Increased life expectancy (Figure 4) Decreasing child mortality Improved nutritional intake Improving living standards as populations grow
Worldwatch Institute (1998), cited in Hawken <i>et al.</i> (2000, p. 309)	(Note: these are generalised at a global level – there are areas of the world where some or all of the above are not occurring.)

Figure 3: Doom, gloom and good news.

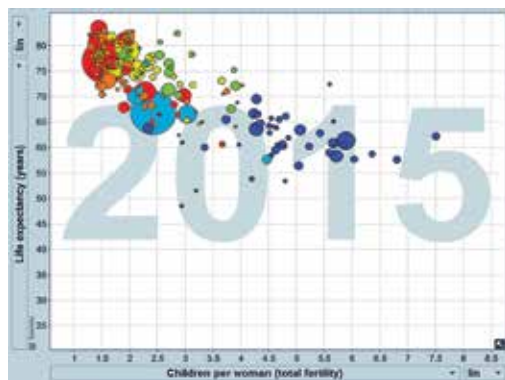
The footnote to the 'Good news' column in Figure 3 also highlights another area where a more nuanced understanding of environmental geographies is called for, namely the notion of change. Understanding change leads on to my fourth question.

Are environmental geographies too fixed?

Harvey (1996, p. 10) highlights the necessity of locating all discussion within a fluid framework. 'Situating oneself in the full flood of all the fluxes and flows of social change makes appeal to any permanent set of values with which to animate collective or well-directed social action suspect.' He continues, 'ultimately by putting environmental and social change into a dialectical and historical-geographical frame of thinking, I hope to derive constructive ways to confront the dilemmas of what so often appear to be contradictory and often mutually exclusive social definitions of environmental problems.'

Having asked four key questions so far, it is now appropriate to discuss more fully what approaches geographers should be taking to these issues.

Figure 4: 'Good news' geography. In the 1950s, most countries in Latin America, Asia and Africa had low life expectancy and high birth rates (in most cases, more than 5 children per woman), fifty later, most of those countries have less than three children per woman, and much longer lives.
Source: www.gapminder.org



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My initial position would be to argue that a more scientific and less emotive approach, perhaps following the lines of Earth System Science, would avoid some of the pitfalls discussed above: 'Earth system science is the study of the Earth System with an emphasis on observing, understanding and predicting global environmental changes involving interactions between land, atmosphere, water, ice, biosphere, societies, technologies and economies.' (Earth System Science Partnership, cited in Goudie and Viles, 2010, pp. 32–3).

At the same time, an integrated and holistic approach is more likely to emphasise the geographies inherent in the topic. Such an approach would allow the development of Anthropocene geographies (Castree, 2015) with an emphasis on understanding the importance of humans in shaping Earth systems. The replacement in 2015 of the Millennium Development Goals by the Sustainable Development Goals (<http://sustainabledevelopment.un.org/index.php?menu=1565>) provides an opportunity for this approach.

It is essential that we adopt a questioning and critical approach to environmental geographies in order to ensure that our pupils receive a high quality environmental education, so I would like to conclude this article with a series of questions for geography educators to consider:

- Are classroom discussions of environmental geography too emotional and simplistic?
- Is geography becoming a victim of the widespread acceptance of Green ideas and the accompanying distrust of Western science?
- Has school geography become a vehicle for promoting Green lifestyles and suggesting that Western models of development are unsustainable?
- Is a focus on sustainable development fostering an anti-modern, anti-development view of the world?
- Are we pretending that capitalism doesn't count? (How we represent capitalism is crucially important in education).
- Is a focus on environmental citizenship detracting from a more analytical geographical approach to environmental issues?
- Are we missing the opportunity to explore more fully the relationship between society and nature? | TG

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