



Ecological Economics and Environmental History

Ecological Economics encompasses a wide range of interdisciplinary research strategies towards the environment (see Ma and Stern, 2006; Paavola and Røpke, 2008; Røpke, 2004, 2005; Spash, 1999). At one end of the spectrum, economic and ecological modelling approaches are combined in innovative and highly quantitative ways (see e.g. Wiedmann et al., 2007; Reed et al., 2006). At the other end are philosophical and methodological inquiries in the interstices of political economy, ecology and philosophy (e.g. Martinez-Alier et al., 1998; Max-Neef, 2005). In between lie various strategies that borrow from a wide range of social sciences, business studies, engineering and systems analysis to address instrumentally important problems that require insights from several disciplines or research traditions.

This special section focuses on Environmental History as an area of Ecological Economics. The area has received relatively little explicit attention to date, despite the large amount of research that actually has been produced on the subject. In 2002, *Ecological Economics* had another special section on *European Environmental History and Ecological Economics*, edited by Joan Martinez-Alier and Heinz Schandl. That special issue focused on social metabolism as a strategy of historical inquiry for understanding the use of resources and energy over time (see Martinez-Alier and Schandl, 2002).

The purpose of this special section is to examine the past as a way of understanding something about the present as well as the future. In his contribution, Fraser investigates how economic, land use and climatic changes combined to precipitate famines, deadly epidemics and war in the 14th century Europe, wiping out centuries of social progress. Gingrich brings us closer to the present, using quantitative data to compare the importance of material imports and exports for the Habsburg Empire and the United Kingdom in the 19th and early 20th centuries. She demonstrates that in both cases physical foreign trade increased faster than domestic resource extraction and consumption and that this led to an increasing integration of international resource supply chains. In his contribution, Paavola examines institutions for water pollution control and their interaction with water supply and sanitation technologies in the United States in the century before the First World War. The article demonstrates that water quality problems, legal institutions and water supply and sanitation technology co-evolved, legal responses lagging behind environmental problems and often undermined by technological change. In their contribution, Otero and his co-authors investigate the 20th century history of land and water transformations in the town of Matadepera near Barcelona where power struggles shaped urban and water development, highlighting how they were fundamentally about environmental justice. In the final contribution, Barca critically examines the mainstream economic history narrative of the energy/development relationships that emphasize mineral technology and private property as the key elements of growth, highlighting the need

to understand energy transitions as social processes that generate unequal distributions of environmental, health, and social costs of mineral energy.

This editorial seeks to step back from the specifics of the above contributions and to briefly discuss the strengths and weaknesses of using an historic approach for understanding the present and future. As we look forward to a future of global environmental change, economic and political globalization, urbanization and population growth the challenges facing humanity seem unprecedented. In some ways they are. Never before has this number of people co-existed on the planet. We have never had at our disposal the tools of modern science or technology. That said societies with large territories, technological innovation, economic and population growth, urbanization, and climate change are not new phenomena. Our species has 10,000 years of experience living in cities and producing food on remote farms. We have spent much of the last 10,000 years developing governance regimes, policies and social arrangements to ensure that citizens are fed, secure and sheltered. Over this period climates, landscapes, politics, populations and economies have been far from stable (Fraser, 2007). Long waves of prosperity have been followed by periods when material life faltered. This rich history can offer fruitful lessons for today.

But while there are many lessons to learn from history, it is also important to understand the limits of using history to explore the present and to project into the future. There is a danger of making false inferences and transferring lessons across wildly dissimilar cases (see Adger et al., 2003). If the past is radically different from the present, the rationale of using historical analysis to shed light on the present and the future is weak. For example, the calls for using traditional ecological knowledge in the management of natural resources are based on the assumption of the utility of a community's accumulated knowledge of environmental stewardship (Berkes et al., 2000). However, it is useful only if today's social and physical environment is broadly similar to the past when the knowledge was gained: traditional ecological knowledge may become obsolete as a result of climatic and economic changes.

Many also argue that thanks to technology we live in such an advanced society that drawing conclusions from the past is erroneous. For example, *Jared Diamond's Collapse* (2005) makes use of historic events such as the collapse of the Easter Island civilization and the abandonment of Viking settlements in Greenland to draw inferences regarding how contemporary societies could be affected by future environmental change. Reviewers of his book have asked how relevant these pre-industrial examples are for understanding the modern predicament (Page, 2005)?

Social scientists and development experts have similarly argued that the 20th century famines, such as the one in China during the

Great Leap Forward and the Russian famines earlier in the century, had more to do with politics and economics than with the environment. Even the Ethiopian famine of the early 1980s, which was ostensibly caused by a drought, was more a function of policy and economics as the “drought” was minor in meteorological terms (Comenetz and Caviedes, 2002). One conclusion from these lines of reasoning is that while in the past inclement weather caused food security crises, today there is no such link (Sen, 1981). Similarly, research on wars in Africa over the 20th century shows that resource scarcity and climate change are not a statistically significant factors in precipitating conflict (Buhaug, 2010). These kinds of observations have led some to speculate that although environmental factors may have shaped past human society they no longer do.

However, research that suggests Western societies stand outside history draws its conclusions from the 20th century when climate was benign for food production (on past weather patterns, see Grootes et al., 1993; for their comparison with 20th century, see Fig. 10 in Carter, 2007). Across much of the world from the Dust Bowl of the 1930s to the Sahelian droughts of the 1990s the sun shone and the rains fell roughly at the right time and in right amounts for growing crops. Even more important was that throughout the 20th century, abundant and inexpensive fossil fuels enabled us to overcome environmental limits with technology. Thanks to cheap energy farmers were able overcome soil erosion by using fertilizers and droughts with irrigation (Soule and Piper, 1992). As a result, the environment did not constrain farm productivity. It is unsurprising, therefore, to discover that the environment had little to do with conflict and hunger in the 20th century.

But should analyses drawn from the past 60 years be the basis for anticipating problems in the next 60 years and beyond? Few commentators expect stable, benign climate and cheap oil to continue for much longer. If this is the case, then it may be more appropriate to explore further into the past to understand how societies have responded to resource scarcity. A growing body of academic research conducts such longer-term historic analyses and expose complex yet significant causal relations between environmental problems and social impacts.

For example, Zhang et al., (2007) draw on centuries of social and temperature data to demonstrate that there is a causal relation between warfare and climate change: in centuries of hostile climate there tends to be an upswing in violence. Ecological crises may emerge in times of both population growth and climate change (Pomeranz, 2000). Parker and Smith (1978) show that the 17th century was one such period. It came on the heels of a century of urbanization and population growth and was characterised by a “General Crisis”: civil wars, disease outbreaks, economic depression, lawlessness, religious intolerance, and state breakdown happened all the way from England to China. This was when Europe and Asia confronted the worst of the Little Ice Age. Fischer (1996) builds on this argument and reviews 2000 years of economic data to show how a key symptom of climate change and population growth is inflation of food prices. Thompson (1971) shows that when food prices rise, food riots become commonplace. Goldstone (1991) uses these data and analyses to demonstrate that such phenomena can cascade into large-scale civil unrest and state breakdown. Chew (2006) paints the bleakest picture, arguing that such periods may lead to large-scale social collapse and the onset of “Dark Ages” – periods of decades or centuries when most indicators of social progress are negative.

The historical point of view also helps to set contemporary environmental issues and policies to their wider historical context, and to appreciate aspects of them which we may have a difficulty in seeing because we are ourselves producers and products of discursive conventions and formations that also gave rise to them. One of the first casualties of a longer-term historical analysis is the view according to which environmental policy was borne out of the civil rights movements and radicalism of the 1960s (see e.g. Inglehart, 1995; Hays, 1987). Civic struggles over water pollution, air pollution,

waste and noise started alongside urbanisation and industrialisation (e.g. Novak, 1996; Stradling, 1999). These struggles lead already early on to new common law doctrines and local ordinances which sought to balance competing incompatible claims to environmental resources and quality (Paavola, 2002; Tarr, 1996). One key institutional dynamics in the past two hundred years has been the successive creation of spatially ever more widely applicable institutions to tackle the expanding scale of environmental and resource use problems. As older, smaller-scale institutions remain in existence, the complexity of institutions of environmental governance has continually grown.

The observations based on historical analyses of environmental problems and institutional responses to them have yielded important insights that are relevant for understanding the present. Firstly, most environmental and natural resource use problems have at their root what Joan Martinez-Alier has termed ecological distribution conflicts (Martinez-Alier, 2002; Martinez-Alier et al., 2010). Groups with competing interests in environmental resources struggle over their control and use, winners often precipitating adverse environmental consequences on the losers. This was certainly the case with early industrial air and water pollution: industrial establishments appropriated environmental sinks for their waste disposal to the detriment of the general public, farmers and smaller businesses (Paavola, 2002; Stradling, 1999; Tarr, 1996). Similar outcomes were generated in other areas of life such as urban and water development (Reisner, 1993; Kallis, 2010). Often new institutions were established or old ones changed only when a threat of a disaster was imminent, only to be forgotten when normality returned. When powerful interests had to compromise because of mounting public pressure, this often resulted in the creation of symbolic policies, which were ineffective by design (Paavola, 2006). Against this background, the increasing emphasis on systems of tradable permits in contemporary environmental policy is not surprising – they represent smallest distributive departure from the status quo.

We draw from this brief assessment a sense of optimism that there are useful lessons to be learned from the past for understanding the present and the future. More than anything, however, the authors of this special section are using historic case studies because they afford a way of seeing both the build-up and causes of important events (be they resource crises or new policy initiatives) as well as the social, economic and environmental effects of these events. A historical point of view offers us a more holistic picture of how societies have responded and may respond in the future to key events, and the effects of these responses. While analogies between past and present are not perfect, there are few real alternatives to the use of historic cases. After all, the future has not yet happened.

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