



Editorial

Ecological modernisation

1. Introduction

During the 1980s and early 1990s ecological modernisation was discussed and developed by a relatively small group of environmental social scientists, particularly within politics and sociology. From here interest spread to other disciplines, such as geography, whilst the sphere of influence expanded away from Germany to the Netherlands, the UK and the USA. The growth of academic interest in ecological modernisation is such that it is now becoming part of mainstream debate in the environmental social sciences. Indeed most of those working on the relationship between environment and society and focussing on the state, production and consumption are likely to be aware of it. If evidence is needed to support this claim then it is found in the discussion of ecological modernisation by social theorists such as David Harvey (1996, pp. 377–383) in *Justice, Nature and the Geography of Difference* and Anthony Giddens (1998, pp. 57–58) in *The Third Way*.

Outside academia programmes of environmental action which are informed by ideas of ecological modernisation and which can usefully be interpreted from an ecological modernisation perspective have also become more widespread. This is particularly the case with respect to strategic environmental planning by governments and the restructuring of production by some major manufacturers. The most often used example of a country putting ecological modernisation into practice is the Netherlands. The series of National Environmental Policy Plans and associated instruments developed and implemented by the Dutch government throughout the 1990s has had a major impact on the ecological modernisation debate. With respect to production the chemicals industry in the Netherlands has also been used as a case example (see for example, Weale, 1992; Hajer, 1995; Mol, 1995; Gouldson and Murphy, 1998).

This growing interest in ecological modernisation, within academia and without, makes a special issue of *Geoforum* timely. In putting this collection together I have attempted, with the help of the other authors, to achieve a number of things. Most importantly the aim of the collection is to develop the ecological modernisation debate theoretically and empirically. Beyond this I have tried to put together a collection of papers that reflects the international scope of the ecological modernisation

debate. The intention also has been to produce a volume that is firmly grounded with respect to all the existing literature. This latter point is important because there has been a tendency recently in ecological modernisation discussions to focus almost exclusively on specific contributions, particularly that of Hajer (1995), without acknowledging the other work in the area. Although Hajer's work is very important the exclusive attention it has received by some writers has skewed the debate considerably, at the expense of work which is arguably more significant, particularly that of Mol (1995).

Finally, in this collection, and again with the help of the other authors, I have attempted to clear up some misunderstandings and to address some of the poorly conceived criticisms that surround the ecological modernisation debate. One common error, for example, involves the failure to clearly distinguish between the analytical and prescriptive dimensions of ecological modernisation. A second one involves the prescriptive dimension of ecological modernisation. That is to view it as a free market approach to solving environmental problems. A third is to assume that those writing about ecological modernisation are uncritically offering it as a way of solving contemporary environmental problems. I hope that this collection goes some way to addressing these misconceptions.

As part of the introduction to this collection I will set the scene by reviewing the important literature in the area. This should help to familiarise readers with the theory if they have not encountered it before. Because each of the following papers draws on this literature it will also provide background detail for the papers themselves. The review is structured in a way that follows the development of ecological modernisation theory over time, whilst also identifying important commentators. Five dimensions of the ecological modernisation literature are discussed and following that some of the main weaknesses of the literature are identified.

2. Technology, entrepreneurs and the transformation of society

Following Mol (1995, pp. 34–40) it is useful first of all to introduce ecological modernisation theory as a

theory of unplanned social change. This will allow the work of Joseph Huber to be considered whilst at the same time establishing the nature of ecological modernisation more concretely. Mol argues that Joseph Huber should be acknowledged as the father of ecological modernisation theory due to his theoretical contributions to the environment and society debate from the 1980s onwards. In this work, Huber (1982, 1984, 1985) began to promote the idea that environmental problems could be addressed through superindustrialisation.

For Huber superindustrialisation involves addressing environmental problems primarily through the transformation of production via the development and application of more sophisticated technologies. In the third of his trilogy written in the 1980s Huber established the spirit of ecological modernisation as a solution to environmental problems when he said that:

... the dirty and ugly industrial caterpillar will transform into a[n] ecological butterfly. (Huber, 1985, p. 20 as quoted by Mol, 1995, p. 37)

Concerning the role of government in this process, Huber believed that a limited amount of intervention was desirable. Consistent with a lot of free market economic theory at the time he felt that government involvement was as likely to confound the process of innovation as it was to produce useful outcomes. He also argued that new social movements, such as the environmental movement, had a limited role to play in bringing about a shift to a more environmentally benign form of industrial society. Economic actors and entrepreneurs were identified as most important in achieving the transformation associated with ecological modernisation.

Huber also proposed that ecological modernisation was an inevitable phase in the development of industrial society. He argued that ecological modernisation is a phase that follows industrial breakthrough (1789–1848) and the construction of industrial society (1848–1980). Throughout all three stages the driving forces are the economy and technology but the third stage of development is driven by the need to reconcile the impacts of human activity with the environment. Huber was convinced that this would be done through ecological modernisation because the associated programme of action fits conveniently with existing social structures.

3. Macroeconomic restructuring: the gratis effect

Subsequent work has selectively built on Huber's ideas. His emphasis on technology has been supplemented, for example, by interest in the role of macro-economic structural change as a result of Martin Jänicke

and Udo Simonis's work (Jänicke, 1985; Jänicke et al., 1988, 1989; Simonis, 1989a,b). These authors emphasise that a central element of ecological modernisation is the restructuring of national economies involving both their technological and sectoral composition. As described by Gouldson and Murphy (1997, p. 75):

... ecological modernisation seeks structural change at the macro-economic level. It looks for industrial sectors which combine higher levels of economic development with lower levels of environmental impact. In particular, it seeks to shift the emphasis of the macro-economy away from energy and resource intensive industries towards service and knowledge intensive industries.

This represents partial de-industrialisation and may involve the phasing out of ecologically 'maladjusted' technical systems and economic sectors that cannot be reconciled with environmental goals.

In a series of papers Jänicke and Simonis established the potential for structural change to solve some environmental problems at the national level by examining the growth trajectories of a range of national economies in association with their consumption of basic resources. In this work the authors recorded the growth of gross domestic product (GDP) in a range of countries including, for example, the Federal Republic of Germany, Japan, and Czechoslovakia. They then examined changes in a number of variables in each of these countries that had associated environmental impacts, e.g. crude steel consumption, weight of freight transport (road and rail), energy consumption and cement consumption. These variables therefore acted as proxy variables for environmental impact.

The results of this kind of analysis indicated that the evolution of these economies had significant implications for environmental impacts. In the case of the Federal Republic of Germany, for example, it was shown that from at least 1960 there had been an almost continuous increase in GDP year on year. However, from 1973 onwards the consumption of cement and steel began to decrease slightly and from 1979 onwards the same happened with energy consumption and the weight of freight transport. Essentially, the authors' argued, the growth of GDP had de-linked itself from these variables and this had positive implications for the environment.

As a result of this kind of analysis Jänicke and Simonis have described an environmental gratis effect – environmental benefit which results seemingly unintentionally from macro-economic structural changes that take place as advanced industrial economies evolve. They have also argued that such macro-economic restructuring is an important dimension of ecological modernisation.

4. The new politics of pollution

A third strand to the ecological modernisation debate is the assessment of the environmental policy choices of governments against what would be consistent with actual ecological modernisation. This type of work generally accepts the prescriptions that can be derived from the theory of ecological modernisation as being at the forefront of policy-making, whilst not saying that they will necessarily solve environmental problems. A list of such policy prescriptions can be inferred from the arguments associated with the theory. In particular it focuses on the changing nature of environmental policy, regulation and decision making. Examples of work in this group is that of Weale (1992), Gouldson and Murphy (1996, 1998) and to some extent Boehmer-Christiansen and Weidner (1995).

In this literature the theory of ecological modernisation is understood as suggesting a government-led programme of action with various key elements. First, to be consistent with ecological modernisation it is argued that policy must be based on its central tenet – that there is no necessary conflict between environmental protection and economic growth and that they may in fact be mutually supportive. To investigate this further the nature of national environmental policies has been examined. For example, Weale (1992) examined the Dutch National Environmental Policy Plan and concluded that its interventionist approach, and the way that it attempted to stimulate innovation through the setting of strict environmental targets, established it as an example of policy consistent with the theory of ecological modernisation.

Second, the integration of environmental policy goals into all policy areas of government is considered as central to a programme of ecological modernisation. Thus ecological modernisation recognises that effective environmental protection can only be achieved through a realignment of broader policy goals relating to areas such as economics, energy, transport and trade. Ecological modernisation requires strong integration with the strategic and operational characteristics of government departments modified to the extent that their original character may be lost altogether.

Third, there is a theme of exploring alternative and innovative approaches to environmental policy within ecological modernisation theory. For example, Mol (1995) identifies the “economization of ecology” as central to ecological modernisation, meaning the introduction of economic concepts, mechanisms and principles into environmental policy. This may involve placing an economic value on nature with the general aim of encouraging economic actors to take the environment into consideration. However, also attracting a considerable amount of attention has been the role for voluntary agreements, such as the Dutch covenanting

system, where firms sign up voluntarily to reduce polluting emissions (see Gouldson and Murphy, 1998). The overall argument here is that new ways of thinking about the relationship between the state and industry should be explored with the broad aim of reregulating (but not deregulating) the environment.

Fourth, because ecological modernisation is based on the invention, innovation and diffusion of new technologies and techniques of operating industrial processes government action in these areas is a focus of ecological modernisation theory. As stated by Weale (1992, p. 78):

Public intervention... is an essential part of ensuring a progressive relationship between industry and environment... implicit is a positive role for public authority in raising the standards of environmental regulation, as a means of providing a spur to industrial innovation.

Therefore, by deriving a set of policy principles and approaches from the theory of ecological modernisation it is possible to assess individual governments against these to determine the extent to which they have adopted the ideas of ecological modernisation, or, to use Weale's phrase, “the new politics of pollution”. Using this kind of approach the Netherlands, Germany and Japan, for example, have been identified as countries that have broadly adopted an ecological modernisation position.

5. Cultural politics and discourse

The fourth dimension of ecological modernisation is to view it as an example of cultural politics and discourse. This strand of work has been developed mainly by Hajer (1995, 1996), particularly in the book *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*, but more recently Dryzek (1997) has followed a similar line in *The Politics of the Earth: Environmental Discourses*.

The cultural politics perspective on ecological modernisation, according to Hajer (1996, p. 256), asks:

... why certain aspects of reality are now singled out as ‘our common problems’ and wonders what sort of society is being created in the name of protecting ‘nature’.

In other words it analyses the social construction of environmental issues.

From this perspective a very critical view of problem claims and solution claims can be adopted. It is suggested that crucial political issues are hidden behind discursive constructs and the aim is to reveal the “feeble basis” upon which one particular choice of development path,

such as ecological modernisation, is made. For Hajer this is done by examining discourse, principally through the concepts of story-lines and discourse-coalitions. From Hajer's (1995, p. 64) perspective ecological modernisation can be usefully interpreted this way:

Ecological modernization is based on some credible and attractive story-lines: the regulation of the environmental problem appears as a positive-sum game; pollution is a matter of inefficiency, nature has a balance that should be respected; anticipation is better than cure... Each story-line replaces complex disciplinary debates.

Consequently Hajer develops a specific view of environmental politics which he views as constituted by discourse. From this standpoint environmental conflicts do not appear to be primarily conflicts over what sort of action should be taken, or whether action should be taken at all, but over the interpretation of physical and social phenomena.

To illustrate this approach empirically Hajer (1995) has described the discourse coalitions that were present in acid rain politics in the UK and the Netherlands during the 1980s and early 1990s. Broadly he argues that in the UK the traditional approach to policy rebuffed the discourse of ecological modernisation although the Netherlands did adopt it to some extent. However, in the latter case, this was because of existing social and institutional affinities for the discourse, and because of the need for arguments that could move beyond the presumed conflict between environment and economy. It was not adopted as a result of any objective quality or truth that could be associated with the arguments.

6. Restructuring and institutional reflexivity

The final strand in the development of ecological modernisation theory has been to view it as an example of institutional reflexivity and the transformation of society. This approach is particularly associated with Mol (1995) and his book *The Refinement of Production: Ecological Modernization Theory and the Chemical Industry* along with the work of Spaargaren (cf. Spaargaren and Mol, 1992; Mol, 1992, 1994, 1996; Spaargaren, 1997). It is essentially an optimistic interpretation of ecological modernisation building on the work of Beck and Giddens who have attempted to understand the nature of risk in modern society, particularly environmental risk, and the reflexivity of individuals or groups in the face of such risks.

For Mol ecological modernisation is an empirical phenomena. It is detectable in the transformation of the

institutions of modernity (public and private) and he interprets this as representing their reflexivity in the face of environmental problems. In other words ecological modernisation is manifest in institutional transformations in government and industry and one of the goals of these transformations is to overcome the environmental crisis. However, this attempt to overcome the environmental crisis does involve making use of these institutions.

Mol's (1995) principle work on ecological modernisation examines the way the Dutch chemicals industry is restructuring in the face of environmental pressures. He examines the response of three branches of the chemicals industry (paints, plastics, pesticides) and concludes that overall the environment has moved from the periphery to the centre of decision making. On a theoretical note Mol concludes that:

Economic institutions such as the commodity and labour markets, regulating institutions such as the state and even science and technology are redirected in the sense that they take on characteristics that cause them to diverge from their productivity-oriented predecessors... Ecological modernization can thus be interpreted as the reflexive (institutional) reorganization of industrial society in its attempt to overcome the ecological crisis. (Mol, 1995, p. 394)

7. The value of the ecological modernisation debate

From the brief review provided above it is clear that the ecological modernisation debate includes a diverse range of literature. This literature crosses academic disciplines and includes fairly pragmatic policy analysis as well as more abstract and theoretical work. In order to begin to assess the value of ecological modernisation it is useful to distinguish between its prescriptive/normative and analytical/descriptive dimensions.

The prescriptive and normative dimension to the theory suggests that the state should explicitly intervene in the market in order to achieve economic growth and environmental protection. To do this it should establish demanding environmental standards with the aim of communicating priorities for industrial innovation. It should also pursue macro-economic restructuring in favour of less resource intensive industries. Beyond traditional command and control instruments government's should make use of a range of more innovative policy measures including, for instance, environmental taxes, strategic environmental assessment and voluntary agreements. At the same time industry should seek out

solutions to production problems through the exploration of cleaner technologies and production techniques. It is argued that if this kind of programme is pursued environmental protection will improve economic competitiveness at the micro and macro-economic levels.

However, the agenda has a number of potential problems and some of these are worth highlighting at this stage. For example, as recently argued by Giddens (1998, p. 58):

The somewhat comfortable assumptions of ecological modernization deflect attention from two fundamental questions raised by ecological considerations: our relationship to scientific advance, and our response to risk.

Here Giddens focuses on the scientific and technological optimism of prescriptive ecological modernization and highlights the fact that it does not appear to be informed by the contemporary concern about risk (see Cohen, 1997).

Beyond the risk debate ecological modernisation's focus at the national level is problematic. So-called solutions to environmental problems may actually only represent the resolution of the immediate problems facing advanced industrial countries with issues such as "regulation flight" to "pollution havens" not addressed (Yearly, 1991). In addition to these concerns Christoff (1996) points out the Eurocentric nature of ecological modernisation which is heavily influenced by regional debates concerning problems like acid rain, he also notes that:

... [In ecological modernisation] the environment is reduced to a series of concerns about resource inputs, waste and pollutant emissions. As cultural needs and non-anthropocentric values (such as are reflected in the Western interest in the preservation of wilderness) cannot be reduced to monetary terms, they tend to be marginalised or excluded from consideration (Christoff, 1996, p. 485).

With respect to the descriptive and analytical dimension of the theory, as mentioned above, the literature is diverse. The problems associated with particular approaches have often been acknowledged and highlighted by the authors themselves. In the case of Huber's work the almost exclusive emphasis on technology and entrepreneurs as determinants of social change, along with the teleological nature of his argument, is problematic. Concerning Hajer's work on discourse Dryzek (1995) has highlighted the fact that he does not acknowledge that the environment may be real and may

exist independently of social construction. Also, Hajer does not convincingly argue the relative impact of discourse on policy outcomes in comparison to more traditional policy literature variables like the nature of chosen instruments, institutional structures, staffing and resources.

Finally, with respect to Mol's interpretation of ecological modernisation as institutional reflexivity, Hajer (1995) raises the possibility that the interpretation is flawed. He doubts whether the phenomena described by Mol necessarily represents reflexivity in practice and to make his point he draws a broad distinction between techno-administrative ecological modernisation and truly reflexive ecological modernisation. Where reflexive ecological modernisation would be a democratic process involving deliberate social choice between alternative development (or non-development) paths techno-administrative ecological modernisation involves experts determining problems and solutions in a less democratic way. It would rely on experts making decisions in relative isolation about superindustrial responses to environmental problems. Techno-administrative ecological modernisation is, Hajer argues, what Mol describes.

Consequently, like all social theory, the ecological modernisation literature may have a number of weaknesses. This is the case in both its prescriptive and descriptive forms. However, this body of work does offer valuable ways of thinking about environmental policy in the short to medium term, even if these will not necessarily solve environmental problems. Most important of all it provides a way of thinking about how to move beyond the conflictual relationship that is often assumed to exist between the economy and the environment. In its descriptive form the literature is valuable for those attempting to interpret and understand the interaction between environment and society. Perhaps most interesting of all is the fact that it provides a way of dealing with the evidence that suggests advanced industrial countries have made progress in dealing with some environmental problems although there may be a long way to go. This is an almost unique contribution given that most work in environmental social science starts by assuming the inability of industry and the state to do anything other than create such problems.

8. Overview of the collection

There are five papers in this collection. In each case the authors draw on part or all of the literature outlined above whilst developing the theory of ecological modernisation further or attempting to address some of the

existing problems with that literature. Briefly I will outline each paper and identify the main contribution that it makes.

As noted above ecological modernisation has traditionally been associated with analysis at the national level and as a result the local focus of the first paper is a departure from the mainstream. In this paper Dave Gibbs uses ecological modernisation to assess the remit and potential of the new Regional Development Agencies (RDAs) in the UK. He argues that following Labour's election victory in 1997, regional policy has undergone a significant shift, particularly in its underlying assumptions. This can be seen in the remit given to the new RDAs and the assumptions underlying their creation. Most importantly it is suggested that conflicts between environment and economy can be reconciled at the local level and that government has a role in making sure this happens. At the same time it is being argued that the environment can be viewed as an area of opportunity for local economic development. However, this paper is also valuable for two other reasons. First, it explores the relationship between ecological modernisation and the idea of sustainable development and helps to clarify arguments in this area. Second, before using ecological modernisation in the analysis Gibbs argues that for analytical purposes it lacks useful mid-range concepts and to address this he supplements the theory with the concept of environmental capacity, as developed by Martin Jänicke.

Lennart Lundqvist's paper is the second in the collection and in it he attempts to explain recent developments in Swedish environmental policy. To do this, like the previous paper, he draws on Jänicke's work on environmental capacity. However, he argues that although this helps to identify macro-scale influences on government and the formation of environmental policy it does not help in explaining what is happening at the micro-scale, within policy networks for example, and why specific arguments are made and policies adopted. To assist in this area he uses Hajer's discourse approach, whilst arguing in reverse that this cannot stand alone because the discourse approach does not adequately take account of those macro-scale influences on policy outcomes which Jänicke focuses on. Lundqvist's paper therefore uses two different theoretical arguments to explain why Sweden appears to be pursuing a programme of ecological modernisation. These two approaches have not been used simultaneously in this way before. The main advantage of doing this is revealed by Lundqvist's paper. That is that when taken together these approaches go a long way to addressing the main weaknesses that they exhibit individually.

In the third paper, which I have written with Andrew Gouldson, one of the central claims of ecological modernisation is examined – that environmental regulation can be used to promote innovative activity in regulated firms and that this will result in environmental and economic gains at the micro-economic level. The paper draws on a theoretical understanding of industrial innovation and argues that the impact of regulation on innovation can be assessed against its ability to promote cleaner technologies, new management techniques and the environment as a strategic concern in industry. This position is then assessed based on research into the impact of Integrated Pollution Control (IPC), as introduced into the England and Wales by the 1990 Environmental Protection Act, on regulated companies. The analysis suggests that under some circumstances regulation can achieve what is suggested by ecological modernisation if it simultaneously establishes the imperative for improvement and develops the capacity of regulated companies to respond to that imperative. However, in the specific case of IPC, because the regulation is not delivered within a framework of explicit targets it fails to establish the environment as a strategic concern and as a result, in the longer term, it is unlikely to promote the radical innovations associated with ecological modernisation.

The paper by Arthur Mol is the fourth in the collection. In it Mol argues that ecological modernisation theory has become one of the dominant sociological theories that try to understand and interpret how modern industrial societies are dealing with the environmental crisis. He then uses the theory to explore and interpret the recent restructuring of environmental non-governmental organisations (NGOs). Although the spectrum of environmental NGOs remains broad, he argues that some general transformations can be identified. For example, in contrast to the environmental NGOs of the 1970s and early 1980s, contemporary NGOs differ in their dominant ideologies, in their position vis-à-vis other actors engaged with environmental deterioration and reform, and in their strategic operations between (and beyond) state and markets. These differences are interpreted as an answer to wider developments in environmental discourse and reform, but at the same time result in new challenges for NGOs. The paper shows that although ecological modernisation theory offers no simple answers, and does not suggest logical trajectories that environmental NGOs can or will follow in their future development, it is able to frame their windows of opportunity. At the same time the transformations undergone by NGOs are seen to be an important part of the wider process of ecological modernisation.

Fred Buttel's paper is the final one in the collection. He starts by identifying the main variants of ecological modernisation and identifies Mol and Spaargaren as the authors who have done most to establish a robust theoretical basis for it. However, Buttel also argues that the rapid growth of interest in ecological modernisation is the result of its affinity with other contemporary intellectual and political-economic phenomena, rather than because it is a particularly coherent social theory in itself. He agrees with Mol who has argued that the core of ecological modernisation must be a theory of politics and the state that focuses on changing political practices and institutions in association with environmental problems. However, he criticises the tendency to link ecological modernisation to the work of Beck on reflexive modernisation and the risk society. After providing a comprehensive list of arguments against turning to Beck (and to some extent Giddens) for theoretical support he suggests that Mol and Spaargaren's approach may more effectively be developed through the work of Evans (1995, 1996, 1997). Evans has developed a set of interrelated notions of contemporary government in his work on embedded autonomy and state-society synergy. In the longer term, according to Buttel, ecological modernisation as a social theory may succeed or fail depending on its ability to link with this kind of debate. Buttel's paper is particularly valuable because it provides a North American perspective on what has until recently been a very European debate.

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