

# Harmonizing Ecology and Economy

With the acceleration of industrialization in the 20<sup>th</sup> century and the environmental degradation that was thought to be the result of which as suggested in virtually all of the environmental theories so far, there emerged many environmental movements that tried to explain the environmental devastation. How do societies work to further their economic development without degrading their natural resources and environment? This was the question facing many Western European nations in the 1970s and 1980s as they found their sustenance bases under threat from further industrial development.

After the 1980's, the focus on environmental devastation was reoriented towards environmental reforms not instead of, but as complementary to. The environmental concerns and the political process has grown with the Club of Rome report of 1972 with which the environmental issues became global and counted as important for sustainable development. During this period, a new idea of "greening of industry", (Huber, 1982) later coined as 'Ecological Modernization Theory' (EMT) emerged in response to these conditions.

There are three very important events in history which are crucial to comprehending the ecological modernization logic. First is the *Brundtland Report* of 1987. This report also known as *Our Common Future* suggested the correlation between economic development and environmental protection. Or as Spaargaren and Mol put it in 1992:

... the concept of sustainable development is based on more opinions than on scientifically based ideas. For this reason and because of the many possible interpretations that can be placed upon it, the concept of sustainable development is only suited to our purpose to a very limited extent. Therefore, we introduce a more analytical and sociological concept with the primarily political concept of development: ecological modernization. (Spaargaren and Mol 1992: 333)

The second is the World Summit on Environment and Development in Rio in 1992 the process of globalizing environmental concerns which the industrialization and modernization found guilty for environmental devastation. Third, the urgent need for action at all levels to reduce the threat of global climate change was the key pronouncement Al Gore (2006) put forth in the impressive international campaign that led to his receiving the Nobel Peace Prize in 2007. (Mol, 2009)

The notion of ecological modernization was first launched by a member of the Berlin state parliament during debates in 1982. (Mol, 2009) This theory suggested that environmental problems could be resolved through 'harmonizing ecology and economy'. (Simonis, 1989) Contrary to beliefs of Neo-Marxism which suggested radical economic system change, Ecological Modernization Theory proposed improving the performance of existing capitalist systems by superindustrialization and increasing eco-efficiency. (Spaargaren and Mol, 1992; Janicke 2000-2008)

## How did Ecological Modernization Theory emerge?

Ecological Modernization Theory was first established in the early 1980s by a German sociologist Joseph Huber (Spaargaren and Mol, 1992) who formed the first foundation of "greening industry" theory and suggested that 'The dirty and ugly industrial caterpillar transforms into an ecological butterfly.' (Huber, 1995)

During its early years, ecological modernization was fundamentally a political program, which had its concept between science and academia and was used as a pressing idea for extensive environmental reform. The coining of ecological modernization, as well as its maturation, was greatly impacted by debates with other schools-of-thoughts and different belief systems on ecological degradation and reform.

Throughout the first period, the early 1980's to mid-1990's, scholars focused on environmental reform through technological innovations; a departure from bureaucratic centric reform, and a new emphasis on the role of market actors and mechanisms. According to Hajer (1995), three core concepts emerged out of this first period's work on ecological modernization: (Hajer, 1995; also cited in Sonnenfeld, 2004)

- -‘make environment degradation calculable especially monetarily’
- -‘Environmental protection is ... a “positive-sum” game.’
- -‘Economic growth and the resolution of ecological problems can be accommodated.’

According to Mol, (1995) ecological modernization’s technological /material objectives such as *waste reduction and elimination, resource recovery and reuse, dematerialization* ( as short term objectives), *resource conservation and clean production* ( as long-term objectives) acquire both through ‘ecologizing the economy’ by using tools of financial valuation of natural resources, gathering of environmental taxes and establishing market incentives along with ‘ecologizing the economy’ through redesigning and improving production, advancing industrial ecology and promoting superindustrialization. (Sonnenfeld, 2000)

During the second and the third periods, late 1980s to present, the primary emphasis on technological innovations as a solution to environmental problems was diminished in favor of a more balanced approach on the respective roles of states and ‘the market’ (Mol and Sonnenfeld, 2000) and more attention was given to mechanisms and broader social dynamics of ecological modernization. These periods have focused on social-institutional transformations and have not dealt with economic-technical aspects of environmental problems. Nonetheless, the environmental problems caused by modernization are solved by developing modern institutions.

Despite the chronological and theoretical differences of the studies mentioned above, ecological modernization theorists have three major perspectives in common; (1) conceiving environmental problems as challenges for economic-technological and institutional reform rather than an effect of prevailing industrialization; (2) emphasizing the need to reform and transform existing structures of technology/science, production/consumption, politics and ‘the market’, and (3) academically being distinct from views such as deindustrialization, postmodernist social constructionism and neo-Marxism. (Mol and Sonnenfeld, 2000)

Since its emergence in the early 1980s, Ecological Modernization Theory has aimed to analyze how modern industrialized societies address their environmental crises. Ecological Modernization Theory claims that modern societies experience a process of institutional reflexivity and develop an institutional capacity to handle their ecological crisis. Ecology is institutionalized in social practices and production/consumption patterns. (Mol, 1995).

Mol (1995) classifies institutional transformations in five groups:

1. *The changed role of science and technology* : Science and technology are criticized for their part in the occurrence of environmental problems as well as being valued for their essential role in solving and preventing them. Traditional curative approaches of environmental policy (repair and end-of-pipe-treatment) are replaced by preventive socio-technological approaches (ecological modernization and structural change)
2. *Increased importance of market dynamics and economic agents*: Some examples would be producers, consumers, customers, banks and business associations as carriers of environmental innovations, reform, and restructuring.
3. *Changes in state-industry relations – changed role of regulation*: A trend towards more decentralized, flexible and consensus-based styles of policy can be observed. (Janicke, 2000). In addition, non-state actors such as non-governmental organizations or business associations take over the traditional administrative, regulatory, managerial, corporate and mediating roles of the state
4. *Modification of position, role, and ideology of social movements*: In the 1970’s and 1980’s, being involved in the decision making related to the environment was limited. However, nowadays, social movements are increasingly involved in private and state decision making institutions regarding environmental reforms.
5. *Changed incoherent practices with reference to sustainability*: A total neglect of the environment and the fundamental counter-positioning of ecology and economy are not seen legitimate anymore. (Spaargaren and Mol, 1992) Cross-generational cooperation concerning the sustenance base has become the primary principle of ecological modernization.

These transformations are believed to be invaluable in the scholarship of ecological modernization not

only because they are used as analytic tools to understand the dynamics of recent processes of environmental reform, but also they are conceived as norms in outlining desirable and feasible methods for future ecological transformation. (Mol, 1995; Spaargaren, 1997; Christoff, 1996; Dryzek, 1997)

The formation of ecological modernization as a social theory occurred primarily in the Netherlands in the early 1990s. (Spaargaren and Mol, 1992) Here, scholarly publications sparked a debate leading to the development of a coherent theory based on the notion of ecological modernization. Principle discussions of this concept included similarities and differences to Ulrich Beck's Risk Society Theory as well as comparisons to deindustrialization. During this time ecological modernization took its place amongst other modernization theories (Wehling, 1992). A key linkage between Ecological Modernization Theory and a new environmental discourse was also made. Unlike the conventional dichotomy which placed economic and environmental needs in opposition, this new idea stated that the two could work together.

Several new concepts emerged from this theoretical work. One of these concepts is ecological rationality which has particular importance to the evolution of ecological modernization as a social theory. This concept differs from classical rationality according to the fact that human behavior and reasoning are adapted to the environment, as opposed to the classical basis which only considers logic, statistics, and probability. This new concept became central to ecological modernization as this new rationale became increasingly important in the design of institutions and ordering of social practices (Mol and Spaargaren, 1993). Because of this addition to ecological modernization theory was able to keep pace with other social, political, and economic theories.

Another key element that came out of the theoretical studies of ecological modernization was the relation and separation between the analytical social theory and the prescriptive normative idea. The original theory that originated from Germany in the 1980s focused on using the use of technology and economy to improve the environment, but after the many interactions and debates with other social theories, ecological modernization as a social theory had drastically changed from this beginning. While both seek to accomplish the same aim the social theory is most often found in the realm of socio-ecological policies due to its analytical nature. While interdependencies remain between the two, it is important to recognize them as independent and separate.

### **What are the prominent critiques of Ecological Modernization Theory?**

The leading critiques of the ecological modernization theory are its technocratic approach, the narrow system-compliant applications, and prescriptive nature, as well as its failure to show quantified end results (Mol, 1997; Janicke, 2004). These critiques are not without merit. While adherents have worked to revise ecological modernization to counter these criticisms, some have proven the limitations of the theory. Each critique will be studied in turn, and the resulting discourse and findings will be presented and addressed.

The foundational idea of technology and economy as the primary agents for environmental improvement rather than the culprits of its degradation stands in stark contrast to the decentralizing ideas that ecological modernization came after (Mol, 1997). It was not only this racial departure that alarmed its critics, but also the "end pipe" solution that it originally generated (Janicke, 1979). These technological fixes were aimed at the symptoms rather than the causes of the environmental degradation, such that their benefits in ecological and economic efficiency only fueled greater growth. Thus, this growth wiped out their short-lived environmental improvements. (Janicke, 1979).

To counter this critique, scholars moved the theory's technology-centric basis to a more balanced stance that put greater consideration on market-state relations and state intervention (WCED, 1987). This, in turn, has led to the replacement of "end pipe" solutions with more dynamic and systematic environmental technologies that aim to contract outdated technologies which cannot meet ecologically stringent requirements. While these alternations have largely addressed this critique, the early failings are still often cited, although they no longer provide an adequate argument.

From its inception, ecological modernization theory has focused on a particular set of conditions as well as a specific and prescriptive approach to solving environmental problems. Its prerequisites of both a capitalist market system as well as a governmental welfare state limit its applications outside of the developed Western world. Furthermore, its optimistic prescription of using technology and economy to solve ecological problems has generated friction with social activists and neo-Marxists. These groups felt that

social actors played a larger role in environmental protection and that using the engines of degradation to solve ecological problems was fundamentally flawed (Mol, 1997). They also pointed to the inability of ecological modernization to solve 'persistent problems' such as global climate change and biodiversity loss, where marketable technological solutions do not exist. Such problems they argued have to be solved in the social dimension requiring much deeper changes in personal lifestyles and social structures (Janicke, 2000).

These critiques expose some of ecological modernization theory's limitations. Despite providing a framework for understanding the complex interaction of economy and ecology outside of its set conditions, the theory lacks the depth to combat these critiques. These critiques highlight the theory's inability to navigate the social dimension without the use of marketable technologies (Janicke, 2000). Also, the inability for technology to solve all of the environmental woes is an admitted weakness of the theory.

The final critique that will be explored is the lack of long-term results or solutions as a result of the application of the Ecological Modernization Theory. Opponents allege that the modernization approach is not applicable when the risk of environmental damage is acute, and an immediate defensive action is required (Janicke, 2000). They assert that a continued increase in environmental efficiency does not represent a solution since these improvements cause further growth. For example, within the issue of coal-fired power plants, while improvements in technology have reduced emissions, they have not caused a shift to a better technology. Instead, they allowed the expansion of the existing paradigm. What is needed, they argue, is the shift to new clean technologies, which ecological modernization cannot deliver; because it seeks to improve the existing economy and environmental efficiency at the same time due to its narrow focus (Janicke, 2000). Furthermore, it is argued that even when efficiency improvements occur, power generation and mining interests, which are negatively impacted by reduced input needs, find new avenues for the use of their products e.g. the standby mode of most modern electronics (Janicke, 2000).

This critique points to the growing obsolescence of ecological modernization theory. While the state-market relations of the 1980's and 1990's worked well with its framework, today's economic and social dimension increasingly do not. This is largely due to the changing nature of the role of the market which is environmental protection. In the same way, environmental protection movement of the 1970s found little traction in the 1990s, Ecological Modernization Theory finds little traction today. Efforts have been made in recent times to relate the theory to networks and flows as a means to remain relevant. (Mol and Spaargaren, 2005, Mol, 1997).

## **Conclusion**

The dominant opinion in the 1970's that the environmental protection would limit the economic development was left its place to a new environmental understanding that seeks economic development and capital accumulation. Ecological modernization theory suggests that the entrepreneurs and industrialists can overcome the environmental problems by super-industrialization which is the process of both increasing the production and decreasing the negative environmental impacts by transforming the industrial production means with applying developed and high technologies. That is, ecological modernization is a production process in which the production is increased and which protects the environment with its high technology. What is to be abandoned is not the capitalist institutions and technology themselves but the old practices of them. And in the long run, with the protection and conservation of nature and natural resources, there is going to be economic growth. The structural alteration of industrialism would be more admissible rather than its complete abolition; because the realization of the environment and its deterioration became possible owing to the modernity and industrialization. In this school of thought, capitalism is seen neither as a prerequisite for nor as a hindrance against environmental innovation. They focus rather on redirecting and transforming 'free market capitalism' in such a way that it less and less obstructs, and increasingly contributes to, the preservation of society's sustenance base in a fundamental/structural way. (Mol, 2009)

Ecological modernization sees the protection of the environment as an important dynamic of economic growth in the long run. With the transformations in the production processes (the harm given to the environment by factories) and the usage of natural resources (which is estimated to decline due to the high technology) will provide a more clean environment and the future generations will be able to benefit from these scarce natural resources. Now that the world has almost exceeded its carrying capacity, the natural resources are very important for the economic growth in future. That is to say, the protection of the environment is the prerequisite for the economic development.

Ecological modernization has become an attractive discourse especially after its acceptance and encouragement by international organizations that provides fund such as the World Bank. Anything that is compatible with the current dominant capitalist system seems to be accepted by the actors, either the state nor the international, transnational organizations. Because the owners of the global capital will probably let the things go as they wish. Even though the ecological modernization theory seems to offer more plausible remedies to the environment than the earlier environmental movements which talk about more revolutionary change, in a realist point of view, not to say there are not any struggles or success, the powerful will choose to protect their short terms interests, not the environment.

## References

- Buttel, F.H. (2000)** 'Ecological modernization as social theory', *Geoforum*, 31, 1, pp. 57–65.
- Christoff, P. (1996)** 'Ecological modernisation, ecological modernities', *Environmental Politics* 5, 3, pp. 476–500.
- Dryzek, J.S. (1997)** *The Politics of the Earth: Environmental Discourses*, Oxford: Oxford University Press.
- Gore, A. (2006)** *An inconvenient Truth: The Crisis of Global Warming*. New York: Viking.
- Hajer, M.A. (1995)** ) *The Politics of Environmental Discourse. Ecological Modernization and the Policy Process*, Oxford: Clarendon Press.
- Hajer, M.A. (1996)** ) 'Ecological modernization as cultural politics', in: S.Lash, B. Szerszynski and B. Wynne (eds), *Risk, Environment and Modernity. Towards a New Ecology*, London: Sage, pp. 246–268.
- Huber, J. (1982)** *Die verlorene Unschuld der Ökologie. Neue Technologien und superindustrielle Entwicklung*, Frankfurt: Fisher.
- Huber, J. (1985)** *Die Regenbogengesellschaft. Ökologie und Sozialpolitik*, Frankfurt am Main: Fisher Verlag.
- Huber, J. (1995)** 'Ecologically oriented Management at Ciba-Geigy AG', co-authored with E. Protzmann and U. Siegert, in: M. Jänicke / H. Weidner (Eds.), *Successful Environmental Policy. A critical evaluation of 24 cases*, Berlin: Edition Sigma.
- Huber, J. (2004)** *New Technologies and Environmental Innovation*, Cheltenham: Edward Elgar.
- Jänicke, M. (1979)** *Wie das Industriesystem von seine mißständen profitiert*, Opladen: Westdeutscher Verlag.
- Jänicke, M. (1993)** 'On ecological and political modernization'. Translation of: M. Jänicke (1993) 'Über ökologische und politische Modernisierungen', *Zeitschrift für Umweltpolitik und Umweltrecht* 2, pp.159–175.
- Jänicke, M. (2000)** ) 'Ecological Modernization: Innovation and Diffusion of Policy and Technology', in : *FFU Report, FORSCHUNGSSTELLE FÜR UMWELTPOLITIK*, Freie Universität , Berlin, pp. 1-17.
- Jänicke, M., & Jacob, K. (2004)**. Lead Markets for Environmental Innovations: A New Role for the Nation State.. *Global Environmental Politics.*, 4(1), 29-46.
- Mol, A.P.J. (1995)** *The Refinement of Production. Ecological modernization theory and the chemical industry* , Utrecht: Jan van Arkel/International Books.
- Mol, A.P.J. (1996)** 'Ecological modernization and institutional reflexivity. Environmental reform in the late modern age', *Environmental Politics*, vol. 5, no. 2, pp. 302–323.
- Mol, A.P.J. (1997)** 'Ecological modernization: Industrial transformations and environmental reform.' in: *The International handbook of environmental sociology*, eds. M. Redcliff and G. Woodgate, 138-149. London: Edward Elgar.
- Mol, A.P.J. (2001)** *Globalization and environmental reform. The ecological modernization of the global economy*, Cambridge (Mass.)/London: MIT press.
- Mol, A.P.J. (2002)** 'Political Modernisation and Environmental Governance: between Delinking and Linking', *Europæa. Journal of the Europeanists*, 8, 1–2, pp. 169–186.
- Mol, A.P.J. and Buttel, F.H. (eds) (2002)** *The environmental state under pressure*, Amsterdam: Elsevier science.
- Mol, A.P.J. and Sonnenfeld, D.A. (eds) (2000)** *Ecological modernization around the world: perspectives and critical debates* , London: Frank Cass/Routledge.
- Mol, A.P.J. and Spaargaren, G. (1993)** 'Environment, modernity and the risk-society: the apocalyptic horizon of environmental reform', *International Sociology*, vol. 8, no. 4, pp. 431-459.
- Mol, A.P.J. and Spaargaren, G (2000)** 'Ecological Modernization Theory in debate: a review', *Environmental Politics* vol. 9, no. 1, pp. 17–49.
- Mol, A.P.J. and Spaargaren, G. (2005)** 'From Additions and Withdrawals to Environmental Flows. Reframing Debates in the Environmental Social Sciences', *Organization & Environment* 18, 1, pp. 91–107.
- Mol, A.P.J. and Sonnenfeld D. A. and Spaargaren, G. (2009)** 'The Ecological Modernisation Reader', Routledge, Environmental Reform in theory and practice.
- Simonis, U. E. (1989)** 'Ecological modernization of industrial society: Three strategic elements.' *ISSC Journal*, 121, 347-363.
- Sonnenfeld, D.A.(2000)** 'Contradictions of ecological modernization: Pulp and paper manufacturing in south-east Asia. In *Ecological Modernization around the world: Perspectives and critical debates* , eds. A.P.J. Mol and D.A. Sonnenfeld. 235-256. Essex: Frank Cass.
- Spaargaren, G. (1997)** *The Ecological Modernisation of Production and Consumption. Essays in Environmental Sociology* , Wageningen: Wageningen Agricultural University (dissertation).
- Spaargaren, G. and Mol, A.P.J. (1992)** 'Sociology, environment and modernity. Ecological modernization as a theory of social change.' *Society and Natural Resources*, 5, 323-344.
- Weale, A. (1993)** 'Ecological Modernisation and the integration of European Environmental Policy', in: J.D. Liefferink, P.D. Lowe, and A.P.J. Mol (eds), *European Integration and environmental policy*, London: Belhaven Press, pp. 196–216.
- WCED (World Commission on Environment and Development) (1987)** *Our Common Future*, Oxford: Oxford University Press.
- Wehling, P.(1992)** *Die Moderne als Sozialmythos. Zur Kritik sozialwissenschaftlicher Modernisierungstheorien*, Frankfurt/New York: Campus.