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ECOLOGICAL MODERNIZATION FOR SUSTAINABLE DEVELOPMENT: CASE STUDY OF THE EU AND CHINA

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Abstract

Ecological modernization theory was developed in the industrialized Western European countries during 80s in order to control environmental pollution and also to ensure their development in sustainable manner. This paper reviewed a number of literatures and tried to explore the implementation progress of the theory in the European countries and the state of ecological modernization process in new industrially developed country China. Review of literature on ecological modernization in the European Union (EU) and China shows that there is implementation and progress of the theory in different countries in the EU despite that it is criticized as 'greening capitalism,' while China on the other hand has started implementing the theory following Western European countries. More time is necessary to realize the full benefit of the theory.

Keywords: ecological modernization; Western Europe; China; sustainable development



1. Introduction

The sustainability of ecological process for any country keeping pace with its economic development is not an easy job. Ecological modernization in this regard plays a very essential role by systematic eco-innovation and diffusion, and has by far the largest potential to achieve environmental improvements (Janicke, 2008). Through economic and environmental policy integration, ecological modernization seeks to provide a substitute to the antagonistic relationship between economic development and environmental protection existing in the developed economies. Sustainable development on the other hand is the combination of sustainable economic systems, sustainable global ecological processes, and sustainable social equity (Dryzek, 2005). Thus ecological modernization is important for overall sustainable development.

2. Scope and Objectives

European countries have experienced dramatic changes in environmental policies and politics during the last few decades, and the root cause for this is considered to be ecological modernization. The European Union (EU) is the pioneer of the ecological modernization concept. The EU has developed into a leader of international climate change policies as the important EU policy actors have been advocates of the ecological modernization theory. They consider that ecological modernization has created a win-win situation where both economic growth and protection of environment takes place (Solario, 2011). China on the other hand experienced rapid and continuing economic growth since the 1980s and, as a result of this, the country managed not only to lift hundreds of millions of people out of poverty, but also improved the lifestyle of growing middle-class of the population. But this success has been achieved at the cost of massive and growing environmental degradation,



including serious pollution of air, soil and water. Ecological modernization in China faced determined multi-level resistance from those firmly committed to the belief that the treadmill of production and high economic growth of the country is more closely linked to regime-legitimacy and the mainstream collective visions of economic prosperity than ecological modernization (Li and Lang, 2010).

This article analyses the state of ecological modernization in two economically powerful and industrially advanced blocks: European Union and China. The major decision makers and motivations behind the promotion of ecological modernization in these blocks have been explored. Moreover, the study tried to explain the major debates and criticism of the theory. In brief, the study will explore the following key issues- critically analyze the state of ecological modernization process in EU and China and identify the role and interest of political and economic factors in ecological modernization. The study will have great political and policy importance and can provide different better understanding to the global environmental politics as it incorporates the implication of ecological modernization in the two industrially advanced and economically powerful blocks in the world. China and the EU are the major industrial producers and economically vibrant. On issues like energy, environment and climate change, the EU and China can play dominant role to achieve and ensure global sustainable development, both for today and for future generations.

3. Methodology

This article reviews the existing literature for incorporating diverse aspect of ecological modernization theory and extensively studies two cases: EU and China, to evaluate the progress of ecological modernization. It appears from the literature that since the promotion of the ecological modernization theory in 1980s in Europe, EU countries had three decades to promote and progress in



the environmental policy reform and attain some progress in ecological modernization. Whereas China has not been able to fully promote the theory and to some extent failed to implement ecological modernization. From this perspective, it is very important and time-worthy to research and explore the above objectives.

4. Theoretical Background

Ecological Modernization Theory was first developed in the early 1980s primarily in a small group of western European countries, notably Germany, the Netherlands and the United Kingdom (UK) (Moland Sonnenfeld, 2000). More specifically, the notion of ecological modernization was first launched by a member of the Berlin state parliament during debates in 1982. Huber (1991) and Koalitionsvertrag (1998) termed ecological modernization as a technology-based and innovation-oriented strategy focussing on the efficient use of resources and providing co-benefits both for ecology and economy.

At its beginning, ecological modernization was essentially a political program. It was neither a theory, nor a concept which included the social dimension of this type of modernization. Addition of ecological modernization with further development was strongly influenced by debates with other schools-of-thought. Ecological modernization concepts developed in western industrialized societies from the concern of degradation of natural resources due to excessive industrialization and expansion of cities, and social concern of protecting vulnerable natural areas from devastating industrialization and urbanization (Mol, 1997). The theory at first redefined the relation between state and market within environmental reform and emphasized the role of market and government for environmental protection. After that, technology and technological development have been emphasized in ecological



modernization ideas and scholars have been more positive and optimistic of the contribution of technology and technological change to environmental reform (Mol and Janicke, 2009).

The ecological modernization concept is thought of as an effective response to a variety of circumstances or imperatives regarding social-ecological thought and fulfills the need and gap within the thought. Rapid expansion of the ecological modernization in the European countries occurred not because it was a well-developed and highly-codified social theory, but rather because it accorded particularly well with a number of intellectual and broader political-economic factors and many of these factors is from outside the realms of sociology and environmental sociology (Buttel, 2000). Ecological modernization also describes asset of processes and perspectives that capitalisms trying to achieve as its version of sustainable development, and ecological modernization is replacing the earlier phase of crude, environmentally damaging industrial capitalism (Pepper, 1998).

Gouldson and Murphy (1996) identified four themes of ecological modernization that need to be considered. The four themes include: environment and economy can be successfully combined for further economic development with the aid of government intervention; environmental policy goals should be integrated into other policy areas; alternative and innovative policy measures should be explored; and the invention, innovation and diffusion of new-clean technologies is essential for....Pepper (1998) pointed out three approaches to ecological modernization including market environmentalism, welfare/interventionist environmentalism, and market-based incentives to economize the environment so that ecological modification will only be used in cases where environmental costs are counter-balanced by welfare benefits.

Sustainable development was formally endorsed by political leaders from more than a hundred and seventy countries at the Rio Earth Summit in 1992. The Rio process refers to the ongoing international



interaction between new social movements, academia, politics and business that has led to the formulation of environmental policy strategies in the context of the United Nations Conference on the Environment and Development (UNCED) in Rio de Janeiro in 1992. Sustainable development not only deals with the interdependencies between economy and ecology, but also combines the ecological question with the social question on a global scale. Sustainable development is supposed to diffuse the long term tension between economic growth and environmental protection (Carruthers, 2001), and a complete formulation of ecological modernization results in sustainable and equitable development (Huber, 2000).

Ecological concerns and ecological modernization gradually gained traction in existing political, economic, and social institutions. Government, markets, and the civil society as actors get involved in the reform process, focusing on various types of pressure they may have exerted on business enterprises (Yee, Lo and Tang, 2013). Janicke (2008) considered that the role of smart government regulation and growing business risks for polluters in the context of multi-level environmental governance are the two driving forces of ecological modernization. These two influencing factors may reinforce each other in the long run and increase the dynamics of environmental innovation. The three stages in the development and maturation of ecological modernization theory are summarized in table 1 below.

Table 1: Stages of development and maturation of ecological modernization theory

Period	Feature
First 1980s	1. Heavy emphasis on the role of technological innovations in for environmental reforms industrial production. 2. Critical attitude towards the state



	<p>3. Favourable attitude towards market actors and market dynamics</p> <p>Criticism</p> <p>1. Treats the environment as another technological problem to be overcome in the pursuit of progress</p>
<p>Second early 1990s</p>	<p>1. Less emphasis and less deterministic view regarding technological innovations.</p> <p>2. More balanced view on state and market dynamics in ecological transformation processes.</p> <p>3. More attention to the institutional and cultural dynamics of EM and the role of human agencies in environment-induced social transformations.</p> <p>Criticism</p> <p>1. Prime criticism has been Euro-centrism.</p> <p>2. Overly optimistic idea of environmental reforms in social practices, institutional developments, and environmental discourses, and its neglect of consumption and life-styles</p>
<p>Third mid-1990s onwards</p>	<p>1. Industrial production is increasingly complemented by paying attention to ecological transformations related to consumption processes.</p> <p>2. Various national studies on environmental reforms in non-EU countries, new industrializing economies in East Central Europe, the USA and Canada.</p> <p>3. Growing attention is paid to the global dynamics of ecological modernization.</p>

Source: Mol, 1999



5. Ecological Modernization in EU and China

The European Union countries and China are the major industrial producers in the world, and at the same time have been the highest carbon emitters in the last few decades. To minimize divergence and agonizing relation between economic development and environmental protection, policy makers of EU and China initiated ecological modernization at different points in time. Since the Western EU is the origin of the ecological modernization theory, they have experienced more than twenty years of ecological modernization. Newly industrialized China on the other hand is gradually moving towards ecological modernization in recent years.

The European Union has a long history of ecological modernization showcasing formulation and implementation of policies to facilitate technological development and environmental protection. This started since 1994 when the European parliament passed a resolution on Environmental Technologies to contribution of the environmental technology industry to future employment and economic development. That assign prime role for government in realizing the potential of linking economy and environment. Apart from this, the Single European Act and the Maastricht Treaty enhanced and expanded the competence of the European Union to design and deliver environmental policy (Gouldson and Murphy, 1996). Ecological modernization in industries of Western Europe ranged from waste management and livestock to carbon capture and storage from the beginning. More recently, there have been efforts to expand the concept beyond its origins and consider its applicability in developing states.

Most European countries are increasing the use of economic instruments and move towards more negotiated and consensual environmental policy making. But the degree to which these innovations take place, their concrete forms, as well as their environmental effect will differ among countries,



depending, inter alia, on their policy style and institutional layout (Mol, 1999). EU Environmental Management and Auditing Scheme (EMAS) showed from econometric analysis that environmental management system of a firm positively influences its environmental process innovations. Apart from this, strong participation of specific departments such as the R&D department is important determinant of environmental innovations (Rennings et al. 2006).

The policy documents of the European Union seek to reverse both trends through the integration of economic and environmental policies. The White Paper of the EU stated that a key factor in achieving a labor-intensive, environmentally benign development path was the creation and promotion of a clean technology base (White Paper, 2000). Ecological modernizations with its technocratic solutions to environmental problems have established an important position in EU, and European environmental policy makers now believe that a long-term and extensive change of technologies reduces environmental burdens, and also ensures sustainable development. The European policy makers also consider that EU countries have the political clout as well as the human, technical and financial resources to provide long-term support to strengthen the capacity of the developing countries. But the implementation and sustainable development related regulations is not yet satisfactory (6th EAP).

European ecological modernization mainly comprises of strategies that seek to change the regulatory and fiscal state to stimulate ecological innovations and more investment to the less polluting resource-efficient technologies. The first global financial crisis of the twenty-first century poses major challenges for the formulation and analysis of environmental policy. The concept of ecological modernization in Europe has been very vocal during the economic crisis than most alternative approaches. According to the Schumpeterian perspective, the recession has accelerated the demise of



old and polluting industries and opened the opportunities for ecological structural change (Feindt and Cowell, 2010).

European Union's environmental strategy for sustainable consumption is primarily driven by neoliberal conceptualizations of the relationship between society and the environment (ecological modernization). They are concerned with potential influence on the consumer society rather than their impact on the food production Chain (Couturier and Thaimai, 2013). Ecological modernization also emerged for the food products of the European Union. Two innovative projects have been undertaken the EU Eco-label and the EU Organic logo in order to instrumentalize the normative philosophy of ecological modernization. This is done with the hopes that incentive-based, incremental transformation in the processes of production and consumption can adequately address the challenges of environmental degradation (Couturier and Thaimai, 2013). European countries have taken different environmental policy initiatives as a part of their ecological modernization effort. Ecological modernization initiatives of some EU countries are summarized in the table 2 below.

Table 2: Initiatives by EU countries for ecological modernization

Countries	Initiatives for Ecological Modernization
Bulgaria	<ol style="list-style-type: none">1. Liberalization and privatization of the Bulgarian economy.2. Increase democratization and public participation in environmental issues.
Denmark	<ol style="list-style-type: none">1. Strategy and framework program of the development of the textile industry.



	<ol style="list-style-type: none">2. Gradual and cumulative expansion of the scope of the environmental policy programs: permits and control, cleaner technology, environmental management systems, and product oriented approach.3. Score system designed to assess environmental performance of the chemicals used in the industries.
Finland	<ol style="list-style-type: none">1. Non-wood bio-energy production in order to replace volatile foreign oil.2. Agri-environmental developments.3. Long term growth-oriented economic and industrial policies along with strong investments in R&D.4. Strong emphasis on technology and innovation in creating societal well-being.
Sweden	<ol style="list-style-type: none">1. High-quality environmental research and monitoring linked to indicators; environmental legislation and the creation of frameworks for administration; the inclusion of environmental considerations in physical planning.2. Commitment to the polluter pays principle; and the development of supports and fiscal mechanisms for linking environmental policy and practice.3. External cooperation, synergies between the environmental and economic agendas.



	<ol style="list-style-type: none">4. The Government Commission on Green Taxation in 1994 and Public Procurement Act of 1992 first linked relevant goods and services with environmental concerns.5. Strong commitment to social democracy and decision making structure.6. Adopted the principle of sectoral responsibility for solving existing environmental problems7. Local Agenda 21.
UK	<ol style="list-style-type: none">1. Environmental best practice programmes for small and medium enterprise.2. Fiscal stimulus launched for green investments.3. Car scrap page premium programme for emission reduction.4. Launched the 'Mainstreaming Sustainable Development package for sustainable economic growth and protect environment.5. Placing of an economic value to ecosystem services with National Ecosystem Assessment.

China took off for ecological modernization from 1998, marked by the publication of the Ecological Environment Construction Plan in 1998, and after that 'Guideline for Ecological Environmental Protection' in 2000. The recent inclusion of environmental domain in the official definition of modernization in China reflects the changing priorities of China for its further and future



sustainable development. China Modernization Report 2007 entitled “Study on Ecological Modernization” attracted large scale media and public attention in China and around the world. The environmental storms launched by China’s State Environmental Protection Administration (SEPA) in 2005, 2006, and 2007 are some recent initiatives for environmental protection, succeeding in achieving some immediate goals. But the China Modernization Report 2007 graded China 100 among 118 countries regarding its ecological modernization level.

Ecological modernization in China is considered as second-time modernization whereas the previous modernizations were focused on social modernization (social welfare, equity, education, etc.). Many of the key concepts of ecological modernization in China were similar to the Western-style modernization such as dematerialization, the eco-friendly economy, decoupling, prevention and clean technology (Zhang, Mol and Sonnenfeld, 2007). China has experienced rapid economic development during the last four decades and this has resulted in large environmental deterioration. China is the front runner in CO₂ emissions and many of its mega-cities are most polluted in the world. China has become the centre of international debate about issues regarding economic development, global warming, as well as environmental protection policymaking and policy implementation.

Lai, Wong and Cheng (2012) investigated how various ecological modernization forces in terms of environmental regulations, customer pressure, and economic pressure are associated with the implementation of green logistics management (GLM) by Chinese export manufacturers. Based on the survey data from 128 Chinese export manufacturers, the finding shows that customer pressure is a significant factor affecting the extent of their GLM implementation, which in turn is positively associated with their environmental, financial, and operational performance. Interestingly, both environmental regulations is not significant drivers for Chinese export manufacturers to pursue



GLM.A study on the information technology and electronic industries in China by Park, Sarkis and Wu (2010) identified and demonstrated that a blend of business and environmental value can be created from adopting a sustainable supply chain management approach. The adoption of a sustainable supply chain management approach is rapidly becoming a key business challenge and opportunity in China and other large emerging economies around the world. Among the ongoing conflict between the goals of environmental conservation and economic growth in China, the state environmental agencies attempted to implement a green national accounting (green GDP) exercise in recent years to publicize the extent to which environment-related costs of economic activity reduce actual GDP, and to promote a more comprehensive and realistic accounting of economic development and of GDP growth(Li and Lang, 2010).

The implementation of environmental protection policies in China is still in its inception. Increasing awareness among political, administrative, and societal actors regarding ecological issues in China has been prime initiatives during the last decade. Possibilities for sustainable action do exist, but currently are at best used very selectively (Grunow and Heberer, 2011).It has been stated that if appropriate strategies, policies, and practices are established and successfully implemented, by around 2050 China could be among the top 40 countries in terms of ecological modernization; and by the second half of the 21st century, among the top 20 countries in comprehensive ecological modernization (Zhang, Mol and Sonnenfeld, 2007). The position of China compare to Germany in terms of environmental sustainability and ecological modernization can be realized from the table 3 below.

Table 3: Environmental sustainability and ecological modernization



Countries	Environmental Sustainability Index 2005		Ecological Modernization Report 2007	
	Index	Ranking	Index	Ranking
Germany	56.9	31	93	5
China	38.6	133	42	100

Sources: Chine Centre for Modernization Research (2007)

6. Political and Economic Actors in Ecological Modernization

Ecological modernization of a country is developed and influenced by multi-level and multi-dimensional actors where not only governments and industry but also NGOs act at all levels of the modernization process. Mol (2010, pp. 460–461) argues that the social mechanisms, dynamics and actors through which social practices and institutions point to three key elements supporting ecological modernization. These elements determine the ability of a particular state to realize ecological modernization. The first element is classified as political modernization, which focuses on the role of the state, non-state, and external actors (international and supra-national institutions). The second element identified is economic and market dynamics and the role of economic agents. This category incorporates producers, consumers and business associations, which use market, monetary, and economic logics in pushing for environmental goals. The influence of this condition would therefore rest on the existence of a functioning and relatively free market economy. The third element has been identified as civil society for supporting the development of ecological modernization. In many cases, these element push for new positions, roles, ideologies, and cultural frames regarding environmental



issues. These three elements reinforce the importance of strong and effective capacity of the state to choose between different options and engage effectively with other internal and external actors for ecological modernization.

Government action can in multiple way foster ecological modernization for a country. Government actors are crucial for stimulating technological innovations by providing fund for green research and development, incentives in the tax system (e.g. feed-in tariffs for renewable energy), creating markets for scarce environmental goods, setting progressive environmental standards that foster technological progress (Feindt and Cowell, 2010). Janicke(2008)introduced two driving forces of ecological modernization- the role of smart government regulation and growing business risks for polluters in the context of multi-level environmental governance. These two influencing factors reinforce each other in the long run and thereby increasing the already existing dynamics of environmental innovation. The experience of the Chinese central government in recent years shows that the political priorities of the centre, the specific interests of local actors, and the structural/ administrative constraints on them explains the behavior of local actors in the environmental field. The environmental policy-making in China is still at the inception level, but awareness among political, administrative and societal actors regarding ecological issues in China has increased during the last decade (Grunow and Heberer, 2011). Neil Carter and Arthur Molcategorize the innovations and transitions in China's environmental governance system into four major categories: political transitions to 'Environmental State', the role of economic actors and market dynamics, emerging institutions beyond the state and market including environmental NGOs, media, social norms, rules and codes, and processes of international integration strategies against desertification; prevention of the intrusion of salt water into the ground water; prevention through a popular protest on a dangerous chemical plant being built, and the control of



vehicle emissions. Similarly Yee, Lo and Tang, (2013) identified three types of actors exist namely political, economic, and to a lesser extent social actors for ecological modernization. They also stated that local government has more formalized relationship with firms, organizational buyer exert noticeable pressure on firms and civil society is less institutionalized actor poses a perceptible threat to some firms. In sum, it is apparent that there are three types of actors- political, market, and the civil society- that function for ecological modernization.

7. Major Arguments against Ecological Modernization

Ecological modernization has been criticized for some of its core themes in the context of both European Union and China. The most common criticism is that its high emphasis on technological innovation and efficiency will not realize long-term sustainability if efficiency improvements are outstripped by growth rates (Feindt and Cowell, 2010). Ecological modernization has also been criticized for its diverse political trajectories, and the value of this framework in the European Union is reduced as it becomes scattered and imprecise (Mol, 1999). The technocratic outlook, corporatist structures, economic rationality and undemocratic nature of the ecological modernization was also a matter of dispute.

Ecological modernization has little attention for the social context of change and the ethical issues are overlooked, that is the modern societies are composed of divergent interests and inequalities of wealth and power. The link between environmental protection and social injustice is not established. Ecological modernization is viewed as an unacceptable attempt to green capitalism by authors such as Blowers (1997), Barry (1999) and Schnaiberg et al. (2002), and considered its reforms as superficial and cosmetic and unable to resolve the ecological crisis.



8. Conclusion

The ecological modernization theory has been developed from the concern for protecting the environment without hampering the sustainable economic development process. The initiative has received significant attention by policy makers in the European countries and China, and is seen as an attractive alternative to the pessimistic deep green, radical alternative approaches such as Neo-Marxist/political economy. Ecological modernization presents both opportunities and challenges when addressing environmental issues. Despite many debates and criticisms, the ecological modernization concept has grown steadily in the European countries and established itself as a role model for other industrially advanced countries such as the USA, China, and India to follow. The practice of ecological modernization in European Union encouraged Chinese policy makers to approach environmental policy reforms in the manner Western Europe has done. Even though the Chinese economy is experiencing double digit growth, they have realized the boundary of the environment and have taken some steps towards sustainable economic development. It is too early to give remarks about successes or failures of the ecological modernization for sustainable development in both EU countries and China. The environmental state today (rise in GHG, global temperature, acid rain, ozone depletion etc.) has developed due to industrial pollution and emission activities of more than hundred years. The solution to such problems without compromising much of economic development in the form of ecological modernization will understandable be time-consuming. It is good that the highest pollutant emitters such as EU and China recognized their responsibility for environmental protection and incorporated policies for ecological modernization.



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