

Ecological Modernization Theory and Sustainable Development Dilemmas: Who benefits from technological innovation?

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Abstract

In this paper, I critically analyse the assertion by ecological modernization theorists that technological innovation and the application of market mechanisms would lead to sustainable development. Ecological modernization theory contends that advancement in technological efficiency and adoption of market mechanisms would create economic competitiveness and environmentally benign outcomes. Improvement in technological efficiency is widely seen as an ideal policy instrument in supporting global efforts to protect the environment and reduce greenhouse gases emissions such as carbon dioxide. However, it appears that the advancement in technological innovation and existing market mechanisms have largely benefited transnational corporations from industrialized countries and undermined efforts to achieve sustainable development in less industrialized nations. Using empirical evidence from less industrialized nations, the paper shows how transnational corporations have relocated their pollution intensive technologies to less industrialized nations through trade or direct investment. In this paper, I argue that, relocating pollution intensive technologies in less industrialized nations may have profound implications for global efforts to protect the environment and achieve sustainable development goals.

Keywords: Ecological modernization, sustainable development, transnational corporations

Introduction

Ecological modernization theory is among the prominent neoliberal theories in environmental sociology (York and Rosa, 2003). The theory came about almost at the time when the advocates of sustainable

development were trying to formulate their own paradigm on economic growth and environmental sustainability. Although ecological modernization theory could be attributed to the work of German, Dutch and British academics; Joseph Huber has been “credited with inventing the concept” (Sutton, 2007:157). The theory contends that continued economic development should be perceived as the best way towards solutions that could mitigate climate change and other environmental problems. Its premise lies in the view that sustained economic growth reduces environmental degradation through technological and institutional transformations; hence industrialized countries can fairly deal with environmental problems. Ecological modernization theory proposes the transformation of five social and institutional structures: science and technology, markets and economic agents, national states, social movements, and ecological ideologies.¹ Proponents of this perspective believe, for example, that democracy, the state and the market can be restructured to accommodate issues that are linked to environmental sustainability (Howes et al., 2010; Sutton, 2007; Young, 2000). It is argued, therefore, that the role of governments should be to create an enabling environment for both innovation and adoption of more efficient technologies. Since the theory sees technological innovation as a solution to current environmental degradation; it assumes that respective countries will be able to address environmental damage through technological fixes.

Likewise, it also calls upon governments to enact policies that aim at rectifying market failures when necessary by providing information and imposing environmental tax regimes. The modernization theory reiterates the importance of recognising economic prosperity and environmental sustainability as mutually inclusive goals. That is to say, well designed government interventions would allow new and more efficient industries; hence increased technological efficiency would bring about economic growth as well as protect the environment (Gendron, 2012; Giddens, 2009; He, 2007). In this paper, however, I argue that the ecological modernization theory fails to take into account the fact that industrialized nations and transnational corporations (TNCs) have so far remained the main beneficiaries of the current technological innovation and prevailing market mechanisms. On the contrary, as a result of inadequate investment in technological innovation and research coupled with ineffective policies, less industrialized nations have instead experienced deteriorating natural

environment as well as slow industrial transformation. Thus, drawing examples from less industrialized nations, this paper examines how transnational corporations² (originating from industrialized nations) have been relocating their pollution intensive technologies to less industrialized countries through trade and direct investment. Empirical evidence suggest that resource-depleting and polluting firms are attracted to invest in less industrialized nations because environmental standards in these countries are, in most cases, relatively less strict as opposed to the industrialized nations (Baum et al., 2016; Morimoto, 2005; Martinussen, 2004).

I argue that increased unsustainable consumption of natural resources, the destruction of ecosystems as well as pollution in less industrialized nations could hinder efforts to achieve sustainable development goals. The United Nations Sustainable Development Summit on 25th September, 2015 adopted 'the 2030 Agenda for Sustainable Development' which includes 17 Sustainable Development Goals (SDGs). The SDGs are founded on the then Millennium Development Goals (MDGs) which ended in 2015. The SDGs include among others: ending poverty in all of its forms; promoting good health and wellbeing; clean water and sanitation; sustainable industrialization, innovation and infrastructure; reducing inequality within and among countries; responsible consumption and production; climate change action; and sustainably managing natural resources to mitigate biodiversity loss (UN, 2018; Kanie and Biermann, 2017; Uitto et al., 2017). In the following section, I first explore the concept of sustainable development as it shares some of the assumptions raised by the ecological modernization theory.

Sustainable Development

Sustainable development has emerged as an important and contested concept in social sciences. The concept has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987:43). It initially surfaced into public debates in the early 1980s when it was first introduced by the International Union for the Conservation of Nature and Natural Resources (IUCN). The main goal was to conserve and sustain ecological resources (Rogers et al., 2008; Carter, 2007; Baker, 2006; Lélé, 1991). However, the concept of sustainable development attracted worldwide recognition after the publication of the much publicized report by the

World Commission on Environment and Development (popularly known as the Brundtland Commission report) in 1987. The commission called for new norms of behaviour and changes in attitudes, social values and aspirations as these are perceived to have a major role in realizing sustainable development³ (Elliott, 2004). Sustainable development as a concept prescribes and evaluates changes in living conditions and such changes are guided by four Brundtland aspirations which are: “to satisfy basic human needs and reasonable standards of welfare for all living beings; to achieve more equitable standards of living both within and among global populations; to be pursued with great caution as to their actual or potential disruption of biodiversity and the regenerative capacity of nature, both locally and globally; [and] to be achieved without undermining the possibility for future generations to attain similar standards of living and similar or improved standards of equity” (Carter, 2001:198). Likewise, the concept of sustainable development encompasses three important dimensions which are the social dimension of sustainable development, economic dimension of development as well as the environmental dimension of sustainable development i.e. environmental sustainability (IRMA, 2018; Harper, 2016; Dauda, 2012; Rogers et al., 2008).

The social dimension of sustainable development is derived from the perspective that, as human beings, we must have access to the basic requirements of quality of life. Such basic requirements of quality of life include among others: security, human rights, health, education and shelter. However, in order to achieve social sustainability, countries are required to create an enabling environment by fulfilling necessary conditions that may allow this to happen. These conditions should include among others, for example, distributional equity, social services, gender equity, population stabilization, as well as political accountability and participation (Rogers et al., 2008; Baker, 2006; Reed, 1996). On the other hand, the economic dimension of sustainable development calls for economic growth that improves the living conditions of the people for the longest time possible. This includes avoiding short-term economic policies that may in turn lead to long term impoverishment. In order to achieve economic sustainability, environmental effects are to be internalized in the production of goods and services with positive effects (benefits) being felt by both producers and consumers (ADB, 1997:55). Achieving economic

sustainability requires governments, producers and consumers to internalize the externalities, and that is to include the social and environmental costs involved in the production and distribution of goods so as to realize the full cost of their products (Rogers et al., 2008:25, Reed, 1996:33). A good example of an externality is pollution resulting from technological innovations. Producers may operate at lower costs and make huge profits if pollution is not internalised in their costs of production. As a consequence, the impacts of pollution may lead to disastrous effects to the society as well as the natural environment (Sosa-Nunez and Atkins, 2016).

Similarly, the environmental dimension of sustainable development emphasizes on the sustainable use of our natural environment in a way that will not compromise the productivity of nature and / or cause harm to human beings in present or future generations. It calls upon the governments to implement the *precautionary principle*⁴ and make it an integral part of development initiatives (Carter, 2007; Reed, 1996). Governments, for example, should refrain from adopting technologies or implementing development projects when it appears that there might be a risk of serious and irreversible damage to natural environment and human health. Thus, for the society to achieve sustainable development, all three dimensions of sustainable development need to be fully integrated and supported as they are intimately interdependent (Baker, 2016).

The concept of sustainable development carries ideas that are supported by ecological modernization theory; and as such the environmental policies, plans and management systems in recent years have largely been influenced by the existing connections between the sustainable development concept and ecological modernization theory. As pointed out earlier, ecological modernization theory contends that investment in technological innovation and efficiency is as an ideal policy instrument for achieving sustainable development. For instance, the most held view, from ecological modernists, is that transnational corporations could play a significant role in mitigating the impacts of climate change because they have newer and cleaner technology which they can transfer to their branches in other countries (Abdul-Gafaru, 2006). However, rather than transferring cleaner technology and addressing pollution in those countries, transnational corporations have, in some cases, been blamed for

having played part or being sources of pollution and environmental degradation in less industrialized nations (Ives, 2018).

In this paper I review empirical evidence from two nations: India (Bhopal Plant Disaster) and Nigeria (Royal Dutch Shell in Ogoniland) to show how transnational corporations (TNCs) have relocated their pollution intensive technologies to less industrialized nations through trade or direct investment.

Implications of Transnational Corporations Investment overseas on environment

Bhopal Plant Disaster in India

In December 1984, a chemical plant owned and run by Union Carbide (India) Limited (UCIL), a partly-owned subsidiary of the US-based transnational corporation known as Union Carbide Corporation was involved in accident which claimed at least 2,000 lives. Other sources have put the death toll up to more than 4000 people (Peterson, 2008; Morimoto, 2005; Dinham and Sarangi, 2002). It is estimated that, between 200,000 and 300,000 people experienced respiratory illnesses because they were exposed to toxic fumes while others sustained injuries in varying degrees. The accident was a result of a leakage of nearly 40 tons of methyl isocyanate gas mixed with other gases, which significantly caused environmental damage in surrounding areas whereby soil and lakes were contaminated (ibid.). Investigation to the cause of the accident revealed that there were operational errors, design flaws, maintenance failures as well as training deficiencies. The Bhopal Chemical plant had poor safety standards but was also found to be technologically weak and inferior to the parent company i.e. Union Carbide Corporation (UCC) in the United States.

The investigation found that the much needed plant instrumentation was also inadequate to run what would be considered the normal chemical plant processes. At the same time, it was noted that the Bhopal plant was constructed near shanty towns, implying that there was lack of adequate risk assessment and management prior to the disaster. In its defence, however, Union Carbide Corporation (UCC) blamed its subsidiary company and the Indian government for the disaster. UCC claimed to have not directly been involved in production operations, material used in

production and selection of the site for the respective chemical plant. It argued that as a parent company it had maintained the same safety and environmental standards as those it applied in the US and other overseas branches. Probably, a more distasteful claim from UCC was the assertion that what contributed to the disaster was India's cultural, social and political backwardness (Pietersen, 2014; Nayar, 2017; Wong, 2008). Despite the fact that laws at the time required any foreign company in India to own no more than 40 percent of an Indian company's stock, UCC was said to own about 50.9 percent (Wong, 2008:145). In this case, Union Carbide Corporation (UCC) was entitled too much of the revenue that was generated by its subsidiary company, Union Carbide (India) Limited (UCIL). This also implies that the majority ownership allowed UCC to influence decisions on its subsidiary company (ibid.).

The Royal Dutch Shell in Ogoniland, Nigeria

The Royal Dutch Shell commenced its oil exploration and production in the Niger Delta from 1958 and remains a major investor in the country's oil and gas industry. Environmental pollution by Royal Dutch Shell in Ogoniland in the Niger Delta is another illustration on how transnational corporations (TNCs) cause environmental degradation in less industrialized countries. Ogoniland is located in south-eastern Nigeria and its inhabitants are involved in fishing and farming as their main economic activities (Agbonifo, 2018). The 1998 report by the UN Committee on Economic, Social and Cultural Rights, revealed that oil exploration by the Royal Dutch Shell has in fact resulted into the deterioration of the natural environment as well as the quality of life in Ogoniland. The company's exploration activities in the area have not only affected the inhabitants but have also caused long time environmental impacts on the Niger Delta's ecosystem (Yusuf and Omoteso, 2016). It is alleged that the Royal Dutch Shell has for years been engaging in hazardous environmental practices such as gas flaring⁵, oil spills and deforestation. In one instance, the company laid many high-pressure pipelines above ground across most villages in Ogoniland which resulted into a significant impact on land that was once used for farming purposes. The Royal Dutch Shell, however, disputes the claim that it has ever caused environmental destruction and instead suggests that it has often observed 'highest' environmental standards in the country (Abdul-Gafaru, 2006; Morimoto, 2005).

Discussion

Transnational corporations have assumed an increasingly important place in the world economy (Mikler, 2018; Giddens, 2009). TNCs are blamed for causing damage on the physical environment. Examples from two case studies above, illustrate how TNCs can seriously cause environmental degradation in other countries. Transnational corporations (TNCs) play an influential role in the world economy as they control much of the global wealth.⁶ TNCs control about 90 percent of all privately owned patents (Letto-Gillies, 2012; Abdul-Gafaru, 2006; Martinussen, 2004; Hansen, 1998). They also have more annual sales than the output of most developing countries and are owned by the majority of shareholders who are based in industrialized nations (Madeley, 2008). Foreign direct investment (FDI) inflows into some countries in Africa by 2006 were found to be two times of their 2004 level. On the other hand, in 2005, FDI inflows rose by 44 per cent into West Asia and by 11 percent in Latin America (ibid.p.2). TNCs are now regarded as amongst the most important bodies in the global economy with profound political, economic, social and cultural impact on countries, people and the natural environment (Baum et al., 2016; Madeley, 2008). It is clear that TNCs can significantly contribute to resource depletion, global pollution as well as climate change. This is because they are among the largest users of raw materials and have partly played a key role in generating greenhouse gases. To defend their image, however, TNCs and other corporate actors have created networks and coalition strategies as well as establishing their prominent presence at international environmental negotiations (Elliott, 2004). TNCs are also accused of influencing the kinds of environmental standards that are set by sometimes relying on political allies in governments. In some instances, they have as well supported research and provided funding to think-tanks. Detailed policy studies in the past, have provided examples⁷ of how corporate and TNC interests have been pursued through “industry-based coalitions to influence environmental decision-making and standard-setting⁸” (ibid.p.117). Therefore, as highlighted in the examples above (see Bhopal Plant Disaster in India and The Royal Dutch Shell in Ogoniland, Nigeria), corporate activity, conducted by the transnational corporations (TNCs), has been associated with environmental degradation through industrial pollution, exploitation of resources and environmental services, investment as well as international trade (Elliott, 2004:13). Empirical studies in the past have also detailed the relocation of pollution intensive

technologies by the transnational corporations elsewhere into less industrialized countries.

Previous experience suggests that through trade or direct investment, transnational corporations have managed to spin off pollution-intensive products into less industrialized countries. This has been possible because of the existing favourable environments for investment in these countries (ibid.). Such investments are a product of privatization and liberalization policies. These neo-liberal perspectives gained more influence in the early 1980s through the introduction of structural adjustment programmes (SAPs).⁹ In the eyes of the neo-liberals and ecological modernization theorists, the global economy should be a free and open market. In this context, production, exchange and consumption of resources is expected to also unfold through the forces of supply and demand, as these forces emerge from free interactions between firms and households in the private sector (Smallman, 2011:86). Thus, in neo-liberal thinking, the role of the governments in the economic sphere is to create an 'enabling environment' i.e. to 'enable' rather than to 'do'. It is within this perspective that governments in the less industrialized nations are compelled to provide regulatory frameworks that maximize the efficiency of global markets. Likewise, the World Trade Organization (WTO) has spearheaded the influence of TNCs in less industrialized nations through WTO agreements. Such agreements have sometimes undermined the control of governments on TNCs investment ventures as highlighted in the Bhopal Plant disaster in India and the Royal Dutch Shell in Ogoniland-Nigeria.¹⁰ In such favourable conditions, transnational corporations would usually seek to reduce costs by adopting less effective environmental technologies, as well as applying poor management practices and standards in their branches overseas (Abdul-Gafaru, 2006; Grossman and Krueger, 1991). On the other hand, TNCs are also blamed for inflating prices for acquiring their technology and at times for preferring to keep control of their technology to avoid competition (ibid.).

There are also suggestions that transnational corporations reinvest only a small proportion of the profits they derive from their investments overseas. The large part of profits accrued by these corporations from investing in developing countries is normally repatriated to developed countries. Worth noting here, is that while most of the countries have

developed laws to protect the environment, the rules vary in respective countries. In some cases, experience has shown that environmental laws in industrialized nations in which most of the transnational corporations are based, and environmental laws in less industrialized nations where these corporations operate differ significantly. In such context, laws governing environmental standards in industrialized nations appear to be very strict as opposed to those in less industrialized nations.¹¹

Studies conducted by the UN Centre on Transnational Corporations (UNCTC) and the Economic and Social Commission for Asia and the Pacific (ESCAP) found the existence of double standards on how transnational corporations (TNCs) adopt environmental standards between industrialized and less industrialized countries. Their findings indicated that among the surveyed countries, TNCs adopted lower environmental standards in less industrialized nations as opposed to their counterparts. Most of the surveyed TNCs had preferred adopting 'local' environmental standards (Morimoto, 2005). There are concerns that transnational corporations may not be held liable for environmental damage they cause in less industrialized countries. This emanates from the fact that these corporations largely act in accordance with the existing lower environmental standards in these countries; and on some occasions are protected by the respective governments in less industrialized nations. Similarly, transnational corporations have managed to expand their economic and negotiating power as they continue conducting business operations overseas as autonomous institutions (Cooney and Sacher, 2019; Wong, 2008). It is from such economic and negotiating power that, they have been able to influence development policy agendas of states and international bodies. With such corporate power, transnational corporations have managed to transform our societies and economies in a different kind of corporate culture (ibid.).

Conclusion

The main focus of this paper was to critically analyse the assertion by ecological modernization theorists that technological innovation and the application of market mechanisms would lead to sustainable development. It therefore sought to broaden our perspectives beyond the existing ecological modernization assumptions that advancement in technological efficiency and adoption of market mechanisms would create economic

competitiveness and environmentally benign outcomes. Generally, the international community agrees that environmental protection is of paramount importance for sustainable development. However, the dominance of transnational corporations in the global economy and their pursuit of maximum profits could undermine the ability of less industrialized nations to realize sustainable development goals. Although SDGs seek to eliminate poverty, fight inequality and injustice as well as tackle climate change, we are still faced with a dilemma on whether such goals are achievable in the current circumstances. Environmental degradation still poses a serious threat which may erode some positive economic gains that have been achieved so far in less industrialized nations. Thus, I argue that achieving 2030 Sustainable Development Agenda is unlikely if TNCs investments in less industrialized nations do not aim at achieving a win-win situation. Empirical evidence suggests that current market mechanisms and advancement in technological innovation still and has largely benefited transnational corporations and industrialized nations. I have pointed out above, that TNCs have continued to relocate unfriendly or pollution intensive technologies in less industrialized nations as they pursue to maximize profits. As a result, this may in future have profound implications for global efforts to protect environment and achieve sustainable development goals. If this trend continues, the global efforts to achieve sustainable development, particularly in less industrialized nations would not be realized as envisaged in the 2030 Sustainable Development Agenda.

Notes

1. The theory suggests that science and technology must work towards the invention and delivery of sustainable technologies while markets and economic agents with the help of nation states can provide incentives for environmentally benign outcomes. On the other hand, social movements should lobby for the state and business to continue with an ecological path and ecological ideologies could assist in mobilizing people to get involved in the ecological modernization of society (Sutton, 2007:159).
2. This paper adopts a definition that refers transnational corporations (TNCs) as those corporations which have their main office or base in one country but which run a significant proportion of their activities in other countries under laws that may not

necessarily be the same as that of their country of origin. Such corporations are heavily involved in world trade and have extensive activities in several countries (Morimoto, 2005; Elliott, 2004). TNCs are sometimes referred as multinational corporations (MNCs).

3. The Brundtland Commission urged for: “a political system that secures effective citizen participation in decision making, an economic system that is able to generate surpluses and technical knowledge on a self-reliant and sustained basis, a social system that provides for solutions for the tensions arising from disharmonious development, a production system that respects the obligation to preserve the ecological base for development, a technological system that can search continuously for new solutions, an international system that fosters sustainable patterns of trade and finance and an administrative system that is flexible and has the capacity for self-correction” (WCED, 1987:65).
4. As one of the concepts in regulatory policies, the precautionary principle states that “lack of scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation” (Carter, 2001:6).
5. Gas flaring is the practice of burning natural gas which is a by-product of oil extraction. Gas flaring is among the contributing factors to acid rain. Acid rain pollutes potable water, stunts crop growth and damages the ecosystem. There are claims that transnational corporations opt for ‘gas flaring’ because it is the cheapest alternative. The companies intentionally avoid other options for managing natural gas (i.e. reinjection into the subsoil and storage for use as source of energy) which appear to be costly.
6. The role of Transnational Corporations in the global economy, especially in the developing countries’ economic development appears to gradually take over the international trade between industrialized countries and developing countries (Martinussen, 2004:123).
7. Examples include: the US-based Alliance for Responsible CFC (Chlorofluorocarbons) Policy which opposed control of ozone-depleting substances; oil companies and shipping opposing regulatory mechanisms to control maritime oil pollution; the fossil fuel industry in the climate change negotiations and the biotechnology industry in the biodiversity negotiations.

8. Less industrialized nations attract transnational corporations by offering grounds for low wages, laxity in environmental controls, and tax-free holiday (Elliott, 2004).
9. Under pressure from the World Bank and International Monetary Fund, the majority of the less industrialized nations adopted structural adjustment programmes. SAPs are associated with measures such as price controls, liberalization of trade and financial flows, privatization and deregulation of domestic financial markets, subsidies and “other restraints on the free play of economic market forces” (Madeley, 2008:4).
10. It is alleged that transnational corporations tend to make decisions in their countries of origin and not in the countries where their subsidiaries operate. Hence, decisions that affect people in less industrialized nations are to a large extent made in TNCs headquarters in industrialized nations.
11. Baker (2006:32) cites Japan as an example of an industrialized country which smelts its aluminium elsewhere and also uses the end products of forest resources from other countries while exercising restrictions on the use of its home forest resources. Japanese transnational corporations are accused of being highly ethnocentric. It is argued that their worldwide investments are usually tightly controlled from the parent companies, and in some cases under close supervision of the Japanese government. The Japanese Ministry of International Trade and Industry (MITI) oversees the activities of all Japanese-based foreign companies (Giddens, 2009:801).

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