

The sociology of ecologically unequal exchange, foreign investment dependence and environmental load displacement: summary of the literature and implications for sustainability

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Abstract

The article begins by summarizing sociological approaches to (1) ecologically unequal exchange, and (2) foreign investment dependence and environmental load displacement. These areas of sociological inquiry consist of structural theories and cross-national statistical analyses that test hypotheses derived from both approaches. It concludes by briefly describing sociological research on global civil society and the environment, with a focus on the world society approach to environmental change. This area of theory and research provides some insights on ways in which global and transnational civil society groups, such as environmental international nongovernmental organizations, can partially mitigate the environmental harms caused by ecologically unequal exchanges and environmental load displacements.

Key words: ecologically unequal exchange, environmental load displacement, foreign investment dependence

Résumé

L'article commence par résumer les approches sociologiques portant sur (1) l'échange écologiquement inégal, et (2) la dépendance à l'investissement étranger et le déplacement de la charge environnementale. Ces domaines d'enquête sociologique consistent en des théories structurelles et des analyses statistiques transnationales que les hypothèses de test dérivées des deux approches. Il conclut en décrivant brièvement la recherche sociologique sur la société civile mondiale et de l'environnement, en mettant l'accent sur l'approche de la société mondiale aux changements environnementaux. Ce domaine de la théorie et de la recherche donne un aperçu sur la manière dont les groupes de la société civile mondiale et transnationales, telles que les organisations non gouvernementales internationales sur l'environnement, peuvent partiellement atténuer les dommages environnementaux causés par des échanges écologiquement inégaux et les déplacements de charge de l'environnement.

Mots clés: échange écologiquement inégal, le déplacement de la charge de l'environnement, la dépendance à l'investissement étranger

Resumen

Este artículo resume para empezar los enfoques sociológicos sobre el comercio ecológicamente desigual, la dependencia de la inversión extranjera y el desplazamiento de las cargas ambientales. Combinamos, en estas áreas de análisis sociológico, la teorías estructurales con los análisis estadísticos internacionales para así comprobar hipótesis que se derivan de ambos enfoques. El artículo concluye con una breve descripción de la investigación sociológica sobre la sociedad civil global y el ambiente, poniendo atención en las relaciones entre la sociedad mundial y el cambio ambiental: ésta es un área teórica y de investigación que arroja luz sobre las maneras con que los grupos de la sociedad civil globales y transnacionales, como las ONG

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ambientalistas internacionales, pueden mitigar en parte los daños causados por los intercambios ecológicamente desiguales y los desplazamiento de las cargas ambientales.

Palabras clave: comercio ecológicamente desigual, desplazamiento de cargas ambientales, dependencia de la inversión extranjera.

1. Introduction

Assessing the political-economic drivers of global environmental change is a multidisciplinary effort. While different disciplines have unique theoretical perspectives that influence research and scholarly discussions, various perspectives that are central to understanding the dynamic couplings of social and environmental inequalities cross disciplinary boundaries. Among such cross-cutting perspectives, few if any have gained more momentum in recent years than the ecologically unequal exchange and environmental load displacement traditions. These traditions are both far reaching in terms of substance and relevance, and both have produced rich bodies of inquiry with real world implications.

Both perspectives include a variety of complementary yet distinct approaches with roots in different social science disciplines, including ecological economics, critical human ecology, and environmental sociology. In this article I summarize the sociological literature for both, beginning with the sociology of ecologically unequal exchange, followed by sociological research on foreign investment dependence and environmental load displacement. These areas of inquiry consist of crisply formulated structural theories and cross-national statistical analyses that test hypotheses derived from both of them. There is a great deal of consistency in the findings across studies in these two perspectives, providing the opportunity for generalizations about how structural and relational characteristics of the world economy shape environmental inequities with implications for ecological and social sustainability at local, transnational, and global levels. After the two summaries, I briefly describe sociological research on global civil society and the environment, with a focus on the world society approach to environmental change. This area of theory and research provides some insights on ways in which global and transnational civil society groups, such as environmental international nongovernmental organizations, can partially mitigate the environmental harms resulting from political-economic processes and interrelationships identified by scholars of ecologically unequal exchange and environmental load displacement.

2. Ecologically Unequal Exchange

Recognition of the structured ecological relations between countries is articulated through the theory of 'ecologically unequal exchange', a multidisciplinary approach that describes the unequal material exchange relations and consequent ecological interdependencies within the world economy, all of which are tied to disparities in socio-economic development and power relations embedded within the interstate system (e.g. Hornborg 1998a, 1998b, 2001, 2009, 2012, 2014; Jorgenson 2006; Jorgenson and Clark 2009; Martinez-Alier 2007; Martinez-Alier *et al.* 2010; Rice 2007). Unequal exchange in international contexts, from a sociological perspective, can be broadly defined as the assertion of asymmetrical power relationships between more-developed / more-powerful and less-developed / less-powerful countries, wherein the former gain disproportionate advantages at the expense of the latter through patterns of trade and other related structural characteristics.

In other words, ecologically unequal exchange refers to the environmentally damaging withdrawal of energy and other natural resource assets from and the externalization of environmentally damaging production and disposal activities within less-developed / less-powerful countries. It constitutes the obtainment of natural capital (stocks of natural resources that yield important goods and services) and the usurpation of sink-capacity (waste assimilation properties of ecological systems in a manner enlarging the domestic carrying capacity of more-powerful / more-developed countries). It is therefore focused upon the manner and degree to which less-developed / less-powerful countries tend to fulfil a role in the global system as a tap for the raw materials and sink for the waste products of industrialized (and post-industrial) countries,

thereby underwriting the disproportionate production-consumption-accumulation processes of more-developed / more-powerful countries (Jorgenson and Givens 2014).

Bunker (1984, 1985) and Bunker and Ciccantell (2005) crafted a body of comparative-historical sociological work that is particularly responsive to the ecologically unequal connections forged through world-economic processes and integration. They illustrate the crucial role that reliable access to cheap natural resources has played in fuelling the rise of global superpowers within a given historical era. From their perspective, orthodox theories of development insufficiently recognize the fundamental differences between the internal dynamics and logic of accumulation of extractive and productive economies, respectively. It is not extraction of natural resources and energy, *per se*, that promotes ecologically unequal exchange, but the socio-organizational consequences this tends to produce between and within exporting and importing nations. The historical interactions between modes of extraction and production create path-dependent dynamics shaping the historical development trajectories of differentially situated countries.

The use of statistical methods to assess key assertions of ecologically unequal exchange theory is quite challenging. As implied by particular components of the theory, the 'vertical flow' of exports from lesser-developed / less-powerful nations to relatively more-developed / more-powerful nations is a structural mechanism through which ecologically unequal consequences are born and maintained. On the flipside, it also matters where human-caused waste is generated, and where it is ultimately sent for disposal. Over the past decade and a half, a number of sociologists, including myself, have attempted to develop and employ appropriate measures in comparative international studies to test structural hypotheses derived from ecologically unequal exchange theory. In the following paragraphs I summarize, in chronological order, some of the developments and advancements of this sociological research, with a focus on contributions I and my collaborators have made. Due to space limitations, I am unable to discuss all past studies in this tradition.

In my dissertation research, I (Jorgenson 2004) designed a measure—referred to as "weighted export flows"—that quantifies the relative extent to which a nation's exports are sent to more-developed countries. This initial weighted index, which involves the use of relational data (export flows between sending and receiving nations) and attributional data (levels of development of receiving nations), includes all exports.

The weighted index is calculated as:

$$W_i = \sum_{j=1}^N p_{ij}a_j$$

Where:

W_i = weighted export flows for country i

p_{ij} = proportion of country i's total exports sent to receiving country j

a_j = GDP per capita of receiving country j

To calculate the measure, the first step is to convert the flows of exports to receiving countries into proportional scores. More specifically, the exports to each receiving country are transformed into the proportion of the sending country's total exports. The second step for the index involves multiplying each proportion by the receiving country's per capita GDP. The third step is to sum the products of the calculations in step two. The sum of these products quantifies a nation's relative level of exports sent to more-developed countries. While GDP per capita was used in this initial weighted index, as discussed below, in more recent studies I use variables that measure other attributes of receiving nations, including measures of nations' military strength.

The original measure was initially used in a study of deforestation from 1990 to 2000, which concluded that the vertical flow of all exports contributes to forest degradation in less-developed countries, net of demographic and political-economic factors, including levels of exports and classic trade dependence measures, such as export commodity concentration and export partner concentration (Jorgenson 2006). Other studies employ my initial weighted exports flow measure, including Jorgenson and Rice (2005) in a cross-sectional analysis of the per capita ecological footprints of less-developed countries, and Shandra, Shor and London (2009) in an analysis of industrial organic water pollution in developing nations. Results of both studies are consistent with the arguments of the ecologically unequal exchange perspective.

Building on the initial findings, in follow-up research I and two former graduate students (Jorgenson, Dick and Austin 2010) employed a more nuanced weighted export flows measure for only primary sector goods (agriculture, forestry, mining) in analyses of deforestation in less-developed countries from 1990-2005. Findings revealed a strong association between forest degradation and the vertical flow of primary sector exports (see also Austin 2010). Likewise, Shandra, Leckband, McKinney and London (2009) used the weighted exports flow measure for primary sector commodities in a cross-sectional analysis of threatened mammals in less-developed countries in the year 2005. Consistent with the theory of ecologically unequal exchange, their results indicate that numbers of threatened mammals in poor nations are positively associated with flows of primary sector exports to rich nations.

To help resolve the temporal limitations of prior studies, I employed more rigorous methods in longitudinal analyses of the vertical flow of exports and the per capita ecological footprints of less-developed countries from 1975 to 2000 (Jorgenson 2009a). Results confirmed a negative association between the overall consumption-based environmental demands per person in developing countries and the flow of total exports from those countries to relatively more-developed nations. The association increased in magnitude over the entire 25-year period, suggesting that these relationships became more ecologically unequal through time.

In a follow-up study, my former students and I (Jorgenson, Austin and Dick 2009) used a similar approach, employing the weighted export flows measure for only primary sector commodities in longitudinal analysis of deforestation and a refined, primary-sector oriented ecological footprint—known as the cropland, grazing land, and timber footprint (e.g. 'CGT footprint')—for a sample of less-developed countries from 1970 to 2000. We estimated fixed and random effects models for both outcomes, allowing for more rigorous hypothesis testing. Consistent with prior research and the arguments of ecologically unequal exchange theory, we found that for less-developed countries, increases in the vertical flow of primary sector exports contributed to increases in forest degradation and concomitant suppression of the CGT footprint across the entire 30 year period of study. Figure 1 provides the estimated elasticity coefficients from the deforestation analysis for the effects of primary sector weighted export flows, forest size, level of development (GDP per capita), population growth, and the size of the primary sector as percent of GDP. A one percent increase in weighted export flows led to a .448 percent increase in deforestation rates, while a one percent increase in GDP per capita led to a .301 percent decrease in deforestation rates. As expected, population growth and the relative size of the primary sector also have noteworthy effects on deforestation in developing nations.

In perhaps one of the most thorough sociological analyses in the broader ecologically unequal exchange tradition to date, Brett Clark and I integrated the tradition with two contemporary theories in environmental sociology: the treadmills of production and destruction, respectively (Jorgenson and Clark 2009). Treadmill of production theory focuses on how an economic system driven by endless growth, on an ever larger scale, generates widespread ecological degradation (Gould *et al.* 2008; Jorgenson and Clark 2012). Treadmill of destruction theory suggests that the military has its own expansionary dynamics, which involve significant environmental and ecological costs (Hooks and Smith 2005; Jorgenson, Clark, and Kentor 2010). We posited that the ecologically unequal exchange perspective intersects with both treadmill orientations. The treadmill of production propels the world economy toward constant expansion, demanding more and more resources to meet its insatiable appetite especially in the articulated consumer markets of developed countries. Similarly, in the interests of national security, technological innovation, political power

and geopolitical influence, the treadmill of destruction facilitates the increased consumption of resources by the nations' militaries and their supporting sectors.

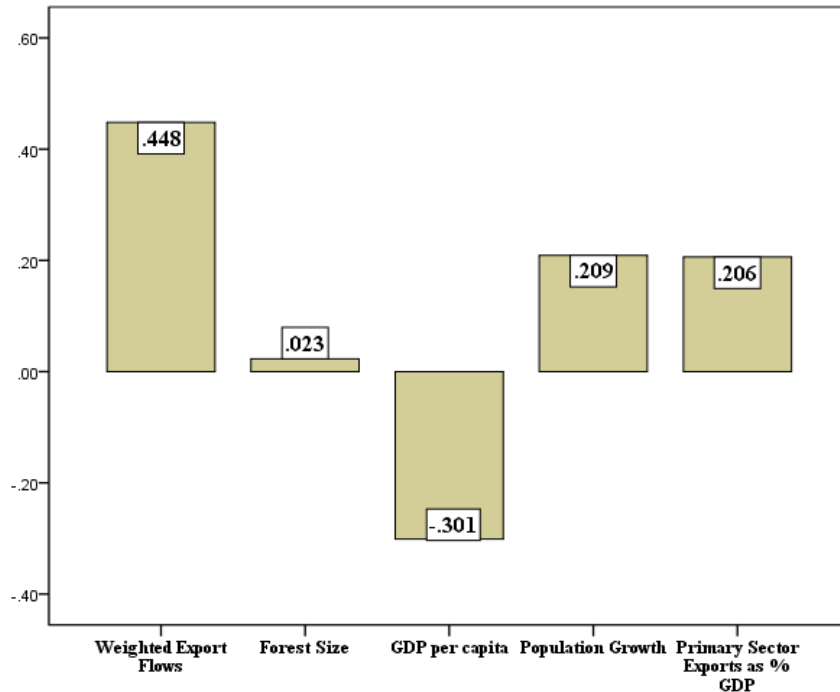


Figure 1. Findings for the analysis of deforestation in 33 developing nations, 1970-2000.

We argued that the populations of more-developed *and* militarily powerful countries are positioned advantageously in the contemporary world economy, and thus more likely to secure and maintain favourable terms of trade allowing for greater access to the natural resources and sink capacity of bioproductive areas within less-developed countries (Jorgenson and Clark 2009). These advantageous positions facilitate the externalization of environmental costs of resource extraction and consumption to less-developed countries, and help create conditions where more-developed countries and those with more powerful militaries are able to over-utilize global 'environmental space'. The 'misappropriation' of global environmental space suppresses resource consumption opportunities for the populations of many less-developed countries. Given the structure and acceleration of both the treadmill of destruction and treadmill of production, we further argued that it is quite likely that the consequences of these processes for less-developed countries are more pronounced than for more-developed countries, and are also likely to increase through time.

To test the arguments and assess the extent to which these perspectives intersect in meaningful and empirically valid ways, we created and employed two export flows measures: one weighted by the levels of economic development of receiving countries, and the other by military expenditures per soldier of receiving countries, an established measure of national-level military power (e.g., Kentor and Kick 2008; Kentor, Jorgenson and Kick 2012). The two export flows measures were then treated as predictors in longitudinal analyses of the ecological footprints of nations from 1975 to 2000. Most notably, the results indicated that countries with relatively higher levels of exports sent to economically developed and militarily powerful nations experience suppressed consumption levels, and these effects—that are independent of one another—are especially pronounced and increasingly so for the less-developed countries, many of which consume resources well below globally sustainable thresholds. In other words, both forms of structural relationships between nations have become increasingly unequal in ecological contexts, further allowing for more

developed and more militarily powerful nations to over- consume (and increasingly so) the world's natural resources. Figure 2 graphs the changing effects of both weighted export flows measures on ecological footprints in less-developed countries. The estimated coefficients became increasingly negative from 1975 to 2000, underscoring that both economic and military power dynamics can shape ecologically unequal exchanges between nations.

All of the sociological research discussed so far focuses on how the structure of international trade in ecologically unequal contexts contributes to environmental degradation in less-developed / less-powerful countries as well as the suppression of resource consumption for domestic populations in developing nations, often well below globally sustainable thresholds (i.e., under-consumption, while more-developed and more-powerful nations continue to over-consume). The under-consumption in less-developed nations also contributes to the well-being challenges for these populations, which underscores the complexity of resource use and human health associations (e.g. Dietz and Jorgenson 2014; Jorgenson 2014; Rice 2008). At the same time, however, it is argued that ecologically unequal exchange relationships between nations are likely to contribute to an increase in the production and dumping of various forms of environmental waste (i.e., pollution) in less-developed countries. Such waste is the result of the 'off-shoring' of environmentally intensive manufacturing and the externalizing of the post-consumption disposal costs associated with manufactured goods for the consumer markets in more-developed countries. The focus here is on the international treatment of less-developed / less-powerful countries as 'sinks' for waste. While such unequal structural relationships and consequences are central to the theory of ecologically unequal exchange, comparative international research on these topics is limited. Two notable exceptions in sociology are Roberts and Parks (2007) and Jorgenson (2012), both of which focus on ecologically unequal exchange and anthropogenic carbon dioxide emissions. Given the scientific consensus on the role such emissions play in global climate change, these studies are far more than academic exercises. Due to space constraints, I only briefly discuss my study published in 2012

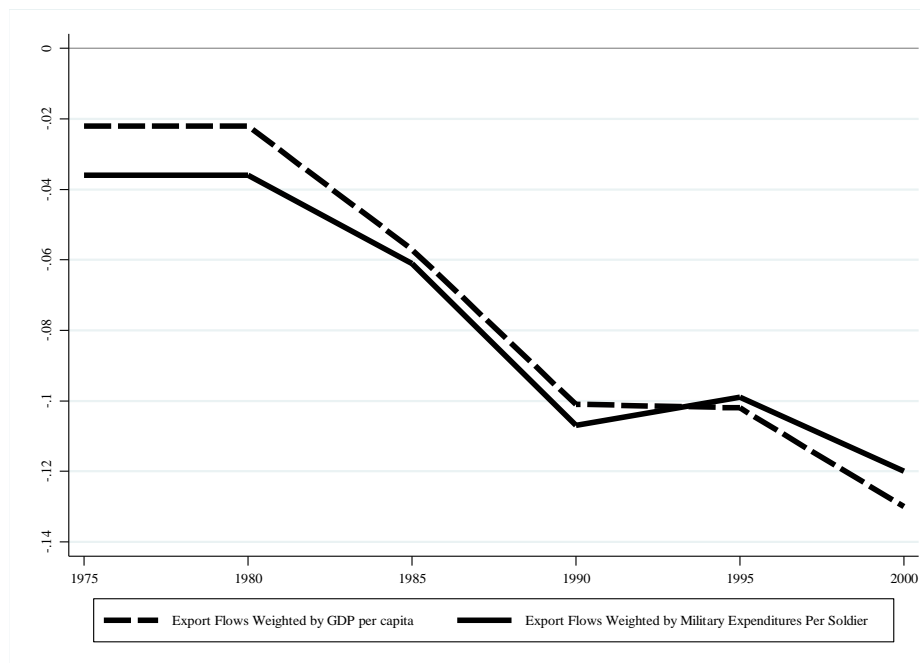


Figure 2: Estimated coefficients for the effects of both weighted exports flows measures on the ecological footprints of less-developed nations, 1975-2000

. I conducted a longitudinal analysis of per capita carbon dioxide emissions for a large sample of developed and less-developed nations for the 1965 to 2005 period (Jorgenson 2012). Overall, I found that the effect of a country's proportion of exports to developed nations on per capita emissions is positive and much larger in magnitude for less-developed countries than for developed countries. Furthermore, and of particular note, in models for a sample restricted to the less-developed countries, I found that the magnitude of the effect of the vertical flow of exports on per capita emissions increases through time, providing evidence of increasingly ecologically unequal relationships between developed and less-developed countries. Figure 3 graphs the growing effect of proportion of exports to developed nations on per capita carbon emission in the sample of developing nations from 1965 to 2005. The effect in 2005 was close to ten times larger than in 1965.

Thus, in my (collaborative) research I have found that for various environmental conditions, relationships between more-developed and less-developed nations appear to have become increasingly ecologically unequal through time, at least in the context of the vertical flow of exports from less-developed / less-powerful nations to more-developed / more-powerful nations. I now turn to a discussion of the sociological literature of foreign investment dependence and the environment, which identifies particular ways in which environmental load displacements occur in different sectors of the economy, largely at the expense of the environment and human well-being for the less-developed nations in the Global South.

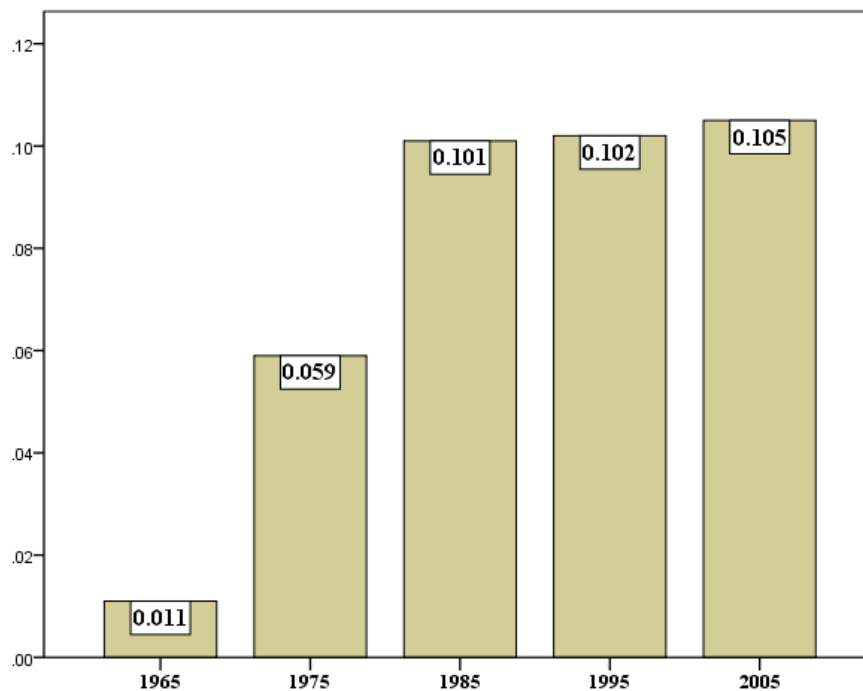


Figure 3: Estimated coefficients for the effect of exports to developed nations on per capita carbon emissions in less-developed countries, 1965-2005.

3. Foreign Investment Dependence and Environmental Load Displacement

Over recent decades, many less-developed countries experienced a deepening of foreign debt, resulting in austerity measures developed by global governance and finance institutions. These austerity

measures, such as structural adjustment programs, encourage the governments of indebted countries to create more favourable conditions for foreign investors and transnational corporations. At the heart of the austerity measures is the assumption that attracting foreign capital will stimulate economic development, thus assisting in debt repayment and increasing the overall well-being for domestic populations. It is commonly assumed that the longer-term benefits of foreign investment will outweigh any short-term environmental harms and human well-being costs, and that attracting foreign investment might eventually lead to more environmentally friendly forms of extraction and production in different sectors through technology transfers and 'spillover effects.' It is anticipated, further, that investing transnational firms may be more likely to install and employ environmentally friendly technologies than their counterparts in host countries. Often referred to as the 'pollution halo hypothesis', this proposition is relatively common in economics (e.g. Cole *et al.* 2008). Empirical support for the pollution halo hypothesis is limited, however, especially in international contexts (see Hoffman *et al.* 2005; Letchumanan and Kodama 2000; Perkins and Neumayer 2009).

Partly in an effort to attract foreign investment and transnational enterprises, many less-developed countries have implemented relaxed labor laws and tax reductions as well as exemptions to environmental regulations designed to protect the natural environment from activities in different sectors of the economy (Leonard 1988; McMichael 2008). The real or perceived threat of capital flight could be viewed as an additional incentive for less-developed countries to offer regulatory concessions to foreign capital. Further, prior research shows that some less-developed countries are less likely than many developed countries to ratify international environmental treaties, many of which deal explicitly with extractive and productive activities that are of direct relevance for transnational corporations (Roberts and Parks 2007). At least partly resulting from these unfolding political-economic processes, in general, the relative presence of foreign investment stocks for all economic sectors combined within less-developed countries increased substantially during recent decades (Chase-Dunn and Jorgenson 2007), and prior research shows that international debt and the implementation of structural adjustment programs in less-developed countries contribute to increases in inward foreign direct investment (Shandra *et al.* 2003).

With the above conditions in mind, and contrary to the pollution halo hypothesis, some sociologists, including myself, have argued that a large proportion of secondary sector (i.e. manufacturing sector) foreign direct investment in less-developed countries finances highly polluting and environmentally unfriendly manufacturing processes and facilities, much of which are outsourced from developed countries (e.g. Grimes and Kentor 2003; Jorgenson 2007, 2009b, 2009c; Jorgenson, Dick and Mahutga 2007). Transnational manufacturing firms often experience economic benefits from this form of environmental load displacement since ecologically harmful manufacturing methods might include relatively outdated and inexpensive mechanization processes and equipment. Moreover, the transportation vehicles owned and operated by foreign-owned manufacturing centers in less-developed countries for the movement of inputs, outputs, and labor are often outdated, energy-inefficient, and thus more polluting (Jorgenson *et al.* 2007). Such conditions can lead to the increased use of fossil fuels by transnational firms for the transportation of raw materials, manufactured goods, and labour (Grimes and Kentor 2003). In line with these arguments, comparative international research indicates that within less-developed countries, manufacturing sector FDI positively affects growth in carbon dioxide emissions (e.g. Grimes and Kentor 2003; Jorgenson 2007, 2009b) as well as other greenhouse gases (Dick and Jorgenson 2010) and industrial organic water pollution (Jorgenson 2009c).

Taken from Jorgenson (2007), Figure 4 provides the estimated effects from statistical models of foreign direct investment in manufacturing and other factors on anthropogenic carbon dioxide emissions for a sample of less-developed countries for the 1975 to 2000 period. The estimated model also includes total population size (estimated coefficient of approximately .70), which is excluded from the Figure for ease of scaling and interpretation. We see that a one percent increase in manufacturing FDI led to a .076 percent increase in carbon emissions, net of the other relevant factors.

Sociologists in this tradition have also empirically demonstrated that foreign investment in the primary sector (i.e., agriculture, forestry, mining) commonly finances agricultural activities, forestry operations, and extractive enterprises that contribute to the degradation of forested areas in less-developed countries (e.g. Jorgenson 2008; Jorgenson, Dick, and Shandra 2011). As agriculture enterprises are integrated

into the world economy, particularly those owned by transnational firms, the scale and intensity of their production tends to increase dramatically. To augment production, forest areas are cleared in a variety of ways, including the burning of biomass and the use of tractors as well as other types of machinery (Altieri 2000). Forest areas are also cleared for export-oriented livestock operations, many of which are controlled by foreign capital (Burns, Kick and Davis 2006). Forms of capital-intensive agriculture can deplete the soil of nutrients, which leads to further expansion and concomitant deforestation (Magdoff, Foster and Buttel 2000).

Many less-developed countries, especially those with relatively larger forest areas, are prime locations for logging operations, and indebted countries are often encouraged to utilize their natural resources, including forested areas, as a form of comparative advantage to attract foreign capital (McMichael 2008). Thus, like agriculture, forestry in general and logging operations in particular have gradually become transnationally organized and globally distributed. The extraction of minerals and other raw materials are the starting points for most global production systems, and transnational firms are key actors in these primary sector activities (Bunker and Ciccantell 2005). Mining activities are carried out in a series of stages, each of which are potentially detrimental to forested areas (Rudel 2005).

Figure 5 reports some of the findings from a study of deforestation in a sample of 49 less-developed countries for the 1990 to 2005 period (Jorgenson 2010). In this analysis I examined the effects of both FDI and weighted export flows in the primary sector, while accounting for the effects of various other economic and demographic factors. A one percent increase in primary sector FDI led to a .213 percent increase in deforestation, while a one percent increase in primary sector weighted export flows led to a .223 percent increase in deforestation. Thus, we see evidence of both environmental load displacement via the effect of FDI and ecologically unequal exchange via the effect of vertical flow of exports.

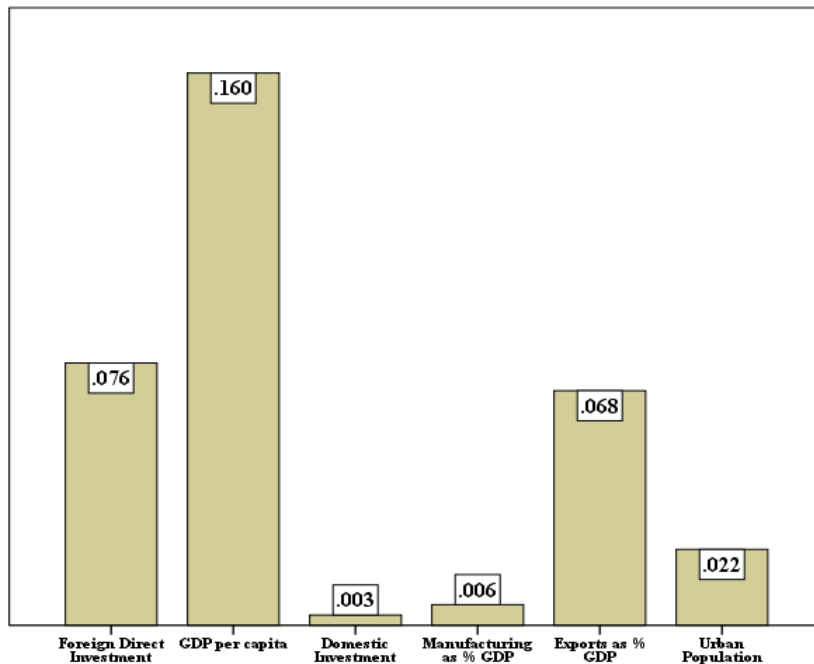


Figure 4: Estimated coefficients for the effects of manufacturing FDI and other factors on Carbon Dioxide emissions in 37 less-developed countries, 1970-2000.

Sociological research also links primary sector foreign direct investment in less-developed countries to growth in the use of synthetic pesticides and fertilizers in agricultural production (Jorgenson and Kuykendall 2008). In the contemporary world economy, much of the production of agricultural goods is globally distributed and largely controlled by transnational corporations headquartered in developed countries. Harriett Friedmann (1990) refers to the rising oligopolistic control of global food production as the 'world food order.' As farming systems in less-developed countries are integrated into the world economy, often through the influence and control of transnational corporations and foreign capital, crop rotation and recycling of organic matter is more likely to be replaced by the high-intensity use of pesticides and forms of synthetic fertilizers. Of additional importance, the use of pesticides and fertilizers in agriculture production is linked to a variety of human health and environmental problems. Transnational corporations investing in or directly operating capital-intensive agriculture within less-developed countries are principal customers for pesticides and fertilizers, some of which are banned in developed countries, but provide potential markets for their producers in locales with fewer environmental protection barriers (Magdoff *et al.* 2000). The use of such agrochemicals often increases through time as more are needed to maintain or increase crop yields. Figure 6 reports the findings from Jorgenson and Kuykendall (2008), concerning the changing effects of primary sector FDI on pesticide and fertilizer use intensity in a sample of 30 less-developed countries from 1990 to 2000. For both outcomes, the effect of primary sector FDI increased through time, almost doubling from 1990 to 2000. The estimated models, which these coefficients are derived from, include a variety of additional independent variables.

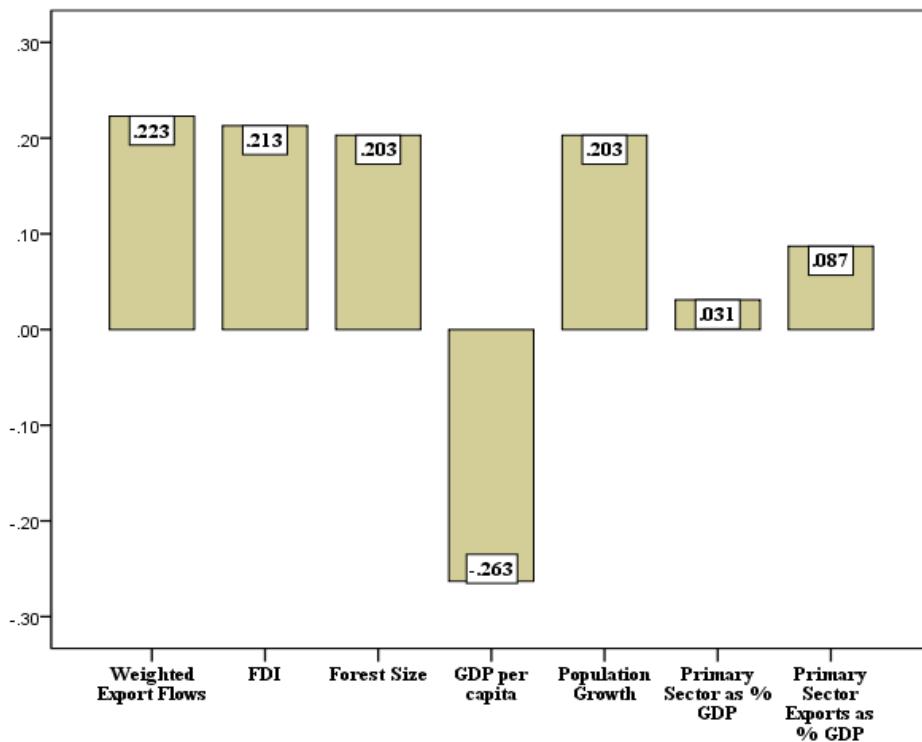


Figure 5. Estimated coefficients for the effects of primary sector FDI, primary sector weighted export flows, and other factors on deforestation in 49 less-developed countries, 1990-2005.

4. Global civil society and the environment

While the sociological research I've summarized in preceding sections focuses on how political economic processes and conditions shape and reinforce ecologically unequal exchanges and environmental load displacements between nations, especially between Global North and Global South Nations, such unequal and unsustainable outcomes are not inevitable. There is a vibrant global and transnational environmental justice movement (as well as countless local environmental movements). These are the focus of large bodies of social movement research in sociology and related disciplines. This scholarship oftentimes focuses on the structure and internal dynamics of the various components of environmental movements, and many case studies highlight how in particular contexts such civil society groups can lessen the environmental harms resulting from international and political-economic inequalities.

At the same time, there is a well-established tradition of macrosociological inquiry, known as world society theory, that takes a more of a "top-down" approach to studying how civil society groups, such as environmental international nongovernmental organizations, are part of an emerging "world environmental regime" that under certain circumstances can reduce the environmental impacts of economic globalization dynamics in general, and ecologically unequal exchanges via international trade and environmental load displacements via foreign direct investment dependence in particular. Like all areas of social science, this body of research has its flaws and limitations (e.g., Buttel 2000; Gareau 2013). Nonetheless, findings from recent comparative-international research in this tradition provides generalizable evidence suggesting that global civil society can successfully enhance prospects for local and global sustainability. These comparative international studies complement case studies of successful environmental justice groups and social movements. In the following paragraphs I briefly summarize this area of literature.

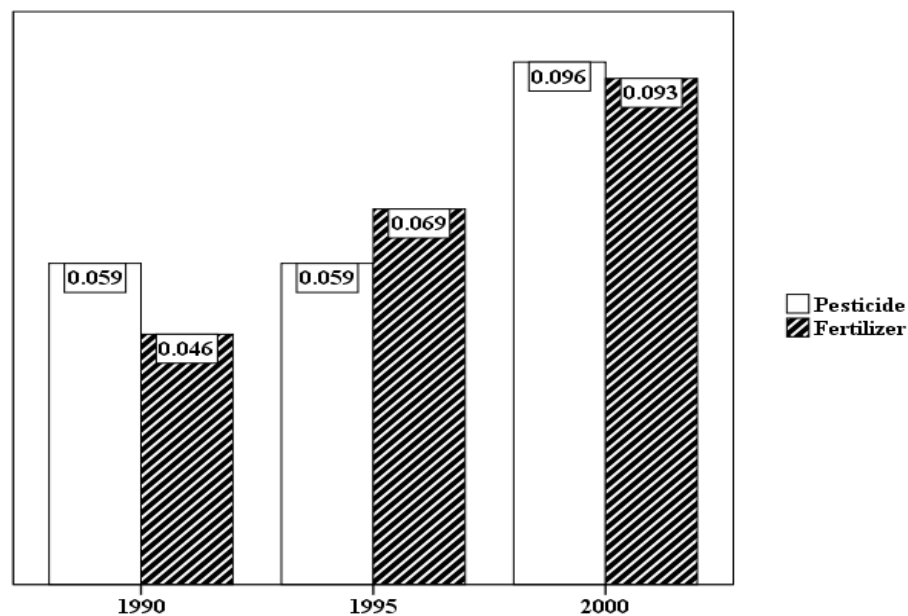


Figure 6: Estimated coefficients for the changing effects of primary sector FDI on pesticide and fertilizer use in a sample of 30 Less-Developed Countries, 1990 – 2000.

World society theory argues that international organizations play an important role in constituting and reinforcing world cultural norms (e.g. Schofer and Hironaka 2005). International nongovernmental

organizations (i.e., INGOs) are known to, among other things, diffuse progressive global models that are adopted by local actors. Meyer and colleagues (1997) describe the existence of a "world environmental regime," composed of environmental international nongovernmental organizations (i.e., EINGOs) and other sorts of civil society groups who diffuse such models. While the majority of environmental research by world society scholars focuses on the emergence of EINGOs as well as other civil society organizations and state agencies (e.g. Frank, Hironaka, and Schofer 2000; Longhofer and Schofer 2010), a growing body of scholarship in this tradition examines the role EINGOs (and other civil society configurations) play in dealing with various forms of environmental degradation, especially in less-developed countries in the Global South (e.g. Hironaka 2014; Schofer and Hironaka 2005; Shandra 2007; Shandra, Shor, and London 2009).

It is argued that EINGOs can intervene in political processes by helping shape the language of international treaties and organizations dealing with the environment, and in the absence of formal enforcement mechanisms, EINGOs can monitor compliance by nations with existing environmental treaties. Consequently, they are in a position of pointing out failures and duplicities of nations. EINGOs are also known to help mobilize support for problem-solving initiatives when national-level avenues are inadequate, and it has become increasingly popular for them to provide support for conservation and environmental protection efforts at sub-national levels (Schofer and Hironaka 2005). In the context of deforestation, for example, this involves funding agroforestry projects, buying and protecting forested areas, and demarcating extractive reserves. For air and water pollution, they often fund the installation of pollution abatement technologies.

EINGOs are known to assist in setting standards, writing codes of conduct, and creating technical guidelines. Codes of conduct provide EINGOs with opportunities to point out compliance failures by particular firms, which, like governments that do not meet treaty obligations, put pressure on corporations to change their practices accordingly. EINGOs are known to employ frames and discourses that encourage social movement activity and, in turn, environmentalism within a nation. In such instances, governments and firms operating within a nation are "squeezed" from above and below to attend to environmental problems (Schofer and Hironaka 2005). Cross-national research has shown that through their collective presence, increased activity, and shared focus on the behaviors and practices of foreign-owned firms, a stronger presence of EINGOs in some nations mollifies the environmental harms of foreign direct investment, at least in the context of anthropogenic carbon dioxide emissions, industrial organic water pollution, and deforestation (Jorgenson, Dick, and Shandra 2011). Thus, such civil society groups can counter the efforts of transnational corporations to outsource their environmental harms. Other recent scholarship shows that a stronger presence of EINGOs can reduce the effects of the vertical flow of exports (as discussed in preceding sections, a mechanism that facilitates ecologically unequal exchanges) on anthropogenic carbon emissions in developing nations (Givens and Jorgenson 2014).

5. Conclusion

This article summarized the sociological portions of the literature for two broader multidisciplinary perspectives concerned with the political economy of global environmental change. First, the sociology of ecologically unequal exchange considers how particular aspects of international trade—especially the 'vertical flow' of exports—allow more-powerful / more-developed nations to externalize at least some of their environmental impacts to less-developed / less-powerful nations, leading to increases in various forms of environmental harms in the latter, including deforestation, loss of biodiversity, industrial water pollution, and greenhouse gas emissions. Resource consumption levels of the less-developed countries often remain suppressed, well below globally sustainable thresholds, with significant public health implications. This research also suggests that relationships have become increasingly ecologically unequal through time. Second, sociological scholarship on foreign investment dependence and environmental load displacement demonstrates that increased levels of foreign investment within less-developed countries, rather than leading to the spread of cleaner technologies and production processes in the secondary and primary sectors, are often linked to dirtier forms of extraction and production, various forms of environmental harms, and

subsequent costs to human well-being. While these two areas of scholarship increase our understanding of human dimensions of global environmental change, like all areas of social scientific inquiry, they have limitations as well. For example, sociological work in the ecologically unequal exchange tradition has yet to adequately examine how the structure of international exchanges allows wealthier and more powerful nations to export hazardous waste to less-developed and less-powerful nations. The second area of scholarship has yet to focus on possible environmental load displacements via foreign direct investment in the services sector (i.e. tertiary sector), an increasingly common area of investment in many developing nations.

The world society and environment literature in sociology identifies particular ways in which forms of global and international civil society groups are known to reduce the environmental harms resulting from the processes and relationships highlighted by the ecologically unequal exchange and environmental load displacement perspectives. This literature provides a counterbalance to the well-established traditions of case-study scholarship on environmental justice movements, further underscoring that global environmental inequalities are not inevitable, and can be reduced through concerted efforts.

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