Globalization of E-waste and the Consequence of Development: A Case Study of China

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Globalization has caused people to be more connected than ever before. While it has opened up innumerable economic opportunities for both post-industrialized and developing countries, it has also created a commodification of electronic waste. This paper explores the effects of the e-waste trade on developed and developing countries, and how China, the largest importer of electronic waste, has used this trade for its own development. While the disposal of electronic goods has already proven to be detrimental, developing countries like China are using this waste as a way to modernize cheaply. With China's economic growth, it has put itself in a position to challenge the Western development model and create a new precedence for the developing world. But depending how China handles this e-waste trade in the future will affect the alternative development strategy for the rest of the world. *[Article copies available for a fee from The Transformative Studies Institute. E-mail address: journal@transformativestudies.org Website: http://www.transformativestudies.org ©2012 by The Transformative Studies Institute. All rights reserved.]*

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The development of the personal computer—and, by extension, the internet—was one factor that allowed for the contemporary globalization era to emerge. Since the 1980s, states have become more interdependent and interconnected. More specifically, globalization has expanded the opportunities for trade, resulting in the erosion of borders between countries and increased ties between the global north and south. It has also allowed a country like China to catapult itself onto the global stage, becoming an economic superpower over the course of thirty years. While globalization has presented innumerable opportunities, it has revealed a

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dark side too—the commodification of electronic waste (e-waste). This e-waste trade allows the life cycle of technological gadgets to come full circle—sometimes being exported back to the same country that produced them. As a result, this creates a relationship between post-industrial countries and developing countries that is much more complex than it seems. While developed nations are the primary consumers of these goods, it is very costly to set up recycling centers and hire labor to break down these gadgets properly. Much like manufacture and production, these nations have begun to look for cheap alternatives for disposal. Developing nations provide cheap labor and lack the comparable environment regulations which allows for such cheap disposal. While the disposal techniques that are used now are harmful to both humans and the environment, these developing nations see technological gadgets as a measure of modernization and economic success. This e-waste trade allows for these countries to obtain of these gadgets cheaply, and be able to pursue government policies for development. Therefore, both post-industrial countries and developing countries are able to benefit from this trade business.

In this article, I will use China as a case study to explain how both domestic politics and globalization foster the need for developing countries to take on this trade. At this time, China is the largest importer of e-waste, as well as the largest exporter of electronic goods. It is also a rapidly modernizing country with a growing middle class—it is on the verge of becoming one of the largest consumers of these electronic goods. However, the e-waste disposal methods are primitive at best, and have had detrimental effects on human health and the environment. As production and consumption continues to increase, there will be more exponentially more e-waste. While China is still technically a developing country based on its GDP per capita, it has become an alternative development model for developing countries. Therefore, the way China handles e-waste could dictate how other developing countries conduct their disposal practices. China has the opportunity to set an alternative precedent to the one created by globalization and capitalism.

In order to be able to understand China's complicated relationship with the e-waste trade, I need to explain what exactly globalization is. While the economy is a significant aspect of globalization, the global economy does not exist in a separate sphere on its own. Instead, it impacts other facets of society. Manfred Steger attempts to capture the complexity of globalization in the following definition: "a multidimensional set of social processes that create, multiply, stretch,

and intensify worldwide social interdependencies and exchanges while at the same time fostering in people a growing awareness of deepening connections between the local and the distant."[1] Therefore, globalization can be considered a multi-dimensional phenomenon—one that has political, economic, cultural, technological, and ecological ramifications.

However, today's globalization has been significantly influenced by the explosion of technological development over the past forty years. Because of this new technology—primarily the computer and the internet—societies can be instantly connected. This makes decisions, communications, and financial and business transactions faster than ever before. It has increased trade—more goods and services are moving around the world now than they ever have in the history of human civilization. Local events have global consequences.

It is important to note that not all countries enjoy these technological advantages or the infrastructure to support them—such benefits of globalization are experienced unequally.[2] Because of the neoliberal economic policies adopted by western countries in the late 1970s, such a system seems to have created a growing disparity and inequality between the global North and global South. In brief, these policies advocated more open and free trading and less state regulation on trade. It was thought that by expanding markets and having more open markets that consumers all over the world would benefit from cheap goods. It was also thought that economies would become more specialized, allowing all economies to prosper because they would have capitalized on their comparative advantage. However, the raw materials and natural resources to make goods come disproportionally from the global South and these goods are extracted cheaply, benefiting the global North. Therefore, the global South does not experience the same economic prosperity, infrastructure development or access to global connections as their Northern counterpart. Lacking the technological infrastructure does not allow the South equal competition in the world markets.

Although the global South may not be able to afford these luxury goods, people all over the world are experiencing the technological revolution. While it might seem to have great benefits for humanity initially, there is a dark side to this digital age. Because of the concentration of wealth and the consumer culture created in the global North, the production and consumption of information technology has grown astronomically worldwide over the past three decades.[3] As more people in the global North consume electronic and electrical goods, more waste is being produced during production and at the end of the life cycle

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of the product. However, this does not mean that developing nations do not experience the digital age. They do, just radically differently—by only putting them together and taking them apart.

In his article "Mapping Environmental Justice in Technology Flows," Alastair Iles suggests that "electronic wastes exemplify the pattern of technology and material flows in the contemporary world economy...consumption and production systems increasingly move resources, energy, pollution, and health effects around the world."[4] I tend to agree with his analysis. When one looks at the manufacture and production of electronic goods, there is a tightly woven web of interconnected countries that depend on each other to produce components cheaply. For example, western nations design the computers, raw materials come from African states to Asian and Pacific nations who will assemble the products and ship them to where they are demanded.[5] What is interesting is now that the consumption of the computer and a myriad of other gadgets is on the rise, the old, unwanted, and damaged products are also contributing to the global economic flows. In other words, even waste and recycling is becoming global, further increasing the economic ties between developed and developing nations.[6]

But, what is electronic waste and why does this dumping occur? E-waste consists of any electronic or electrical device that is unusable or outdated, including but not limited to: computers, refrigerators, fax machines, cell phones, televisions, printers, software and microwaves.[7] Because this technology develops so rapidly, it becomes obsolete faster.[8] That means that there has been an exponential accumulation of unwanted, outdated, or broken digital gadgets. These products consist of valuable components, many of which are reusable. However, they also contain hundreds of toxic components that make them very hazardous to the environment and people alike if disposed of improperly.[9]

Technological goods are consumed primarily by individuals and businesses in developed nations. While strict regulations against hazardous dumping and proper dismantling of these unwanted gadgets exist in these countries, the global economic climate heavily influences how such recycling occurs. First and foremost, the consumption culture in these nations creates a periodic turn-over rate of these gadgets. Consumers are more likely to replace their 2-3 year old gadgets with new ones rather than having them upgraded. However, there are only about a small percentage of consumers who actually attempt to discard these gadgets properly. That is because there is very little awareness of the

hazardous components within this waste or very limited accessibility to proper recycle centers. It is important to note however, that most people do not know how to get rid of these gadgets—they will either discard them normally as they would any other trash or they will store them indefinitely.

Compared to the number of digital and electrical products consumed, the recycling infrastructure is relatively minimal in these countries.[10] Nonetheless, recycling still occurs provided that the consumer has knowledge of and access to such centers. How these items are recycled is up to the centers. For example, in the United States, consumers can pay recycling centers specialized in disposing and dismantling e-waste to take their e-trash. Those centers can incur the cost to dismantle and dispose, or they can sell it to a foreign trader.[11] Most recycling centers will choose the latter. This is because in order for these companies to operate properly, they would have to outfit their facilities according to strict environmental laws and regulations—a process that has significant initial and maintenance costs. It is more economical for the recycling centers and businesses to make a profit from the consumer and from the trader rather than doing it themselves. As mentioned before, the opening of the global markets through globalization has allowed for countries to find cheaper ways of doing things, including disposing of trash. It incentivizes these businesses to find cheap alternatives.

Another reason why exporting e-waste occurs is that there is no effective automated way to recycle these gadgets. In order for these gadgets to be broken down safely and to not spread toxic contaminants, much of the disassembly requires manual labor.[12] While this can be more cost-efficient, the manual labor force in developed countries is more expensive than those in developing countries. As a result, much of this waste is exported back in many of the countries that contributed to the manufacturing or production of such goods.

Some activists attempt to demonize post-industrial societies for the e-waste trade, painting global South victims being forcibly dumped on by the West. However, it is much more complicated than that. This does not mean that I reject the pathologies of the e-waste trade. It means that there are multiple dimensions to the e-waste trade that need to be considered, along with the human health and environmental ramifications. Some of the dimensions of globalization explain why these countries take on such a trade.

Because of the interconnectivity and interdependency created by globalization, developing states—including China, India, Nigeria,

Vietnam, Pakistan, the Philippines, Ghana, and others—see the global North as a model for development.[13] The developed countries have a well developed technological infrastructure—this is seen by the developing countries as an important aspect of development. These countries also recognize if they want to grow economically so that they can better compete in the global economic system, they need to operate similarly as their developed counterparts. Therefore, many countries are partaking in such trade because they are able to extract some much needed resources cheaply from unusable waste. These countries also are obtaining still-functional products and are using them to increase GDP and build up their technological infrastructure. But, it must be understood though that e-waste is not being exported to the countries with the cheapest labor or least rigorous environmental codes. Nor is it distributed evenly to nations in the global South. Some countries, regions and cities attract more e-waste shipments than others. Iles rejects the idea of "race to the bottom" in the e-waste trade, and points out in his article that the "international economy—coupled with local and regional developments—help channel wastes to countries also endeavoring to reach the top, at least according to neoliberal, industrial development models."[14]

In many of these developing countries, development is usually a top priority of the government. Introducing and implementing regulations are secondary policies to development. However, this does not mean that all developing countries lack regulations about health and the environment. As it stands though, many countries take on this e-waste without taking any precautionary measures against such outcomes.[15] It seems as though the developed nations have set precedence for development in the global South—many of these developing countries believe that there is a necessary initial environmental trade off for development and economic growth.[16] At the same time, as more literature is released on this subject, these governments are recognizing the problems that come with the e-waste trade that maybe there is a need to change policies. In May 2002, a group of Asian nations met to discuss the negative consequences of the trade. They came to a dilemma at this meeting—e-waste carries significant risks and that all players in the e-waste trade needs to be better managed but at the same time they like the benefit of obtaining raw materials cheaply.[17]

The reason for China's involvement in the e-waste business seems to stem partially from the revolutionary economic policies of 1979. When Deng Xiaoping called for economic change in China, his idea was to

open China to the rest of the world and modernize the nation. What he did not anticipate were the social, economic, and political ramifications that developed in the wake of his policies.

If we consider the rapid industrialization and shocking economic growth rate of 10% a year, we could say that these policies were wildly successful.[18] However, it would be foolish to use economic success as the only measure for a country's prosperity. These policies also contributed to a number of problems that have been masked by the country's economic success. Prior to the reform, the Chinese Communist Party (CCP) implemented a decentralization program or what they called a "fiscal contracting system."[19] Under this policy change, local governments were required to become more financially responsible over their areas and less dependent on Beijing.[20] As a result, the local authorities gained a certain amount of autonomy. When Beijing tried to reverse this policy in the mid-1990s, local authorities were less than willing to relinquish the power they had been given.

By being financially independent, local governments could operate as they wished. They developed industries in their areas in response to the 1979 reforms. Over time, economic growth became the priority of these leaders—they believed that as long as their area was making record profits, everything else would be fine.[21] They saw economic growth as way to gain political promotions and other perks. It was also considered the easiest way to maintain a position of power—if their area was economically prosperous then there would be little or no social dissent. As a result this led to a policy of "growth at any cost."[22] When Beijing tried to reign in its power, local governments saw this as threatening to their own policies. If they gave up their ten years of self-rule, they would have to follow the policies dictated by the central government. This might clash with the local economic policies as well as economic growth.[23]

The repercussions of 1979 economic reforms have slowly made themselves visible. This reform was ultimately supposed to improve the lives of the Chinese people. While it did achieve this, it also has contributed to social unrest, a growing disparity between social classes, and environmental issues that have skyrocketed China into the spotlight as much as their economic growth.[24] Because the power was decentralized when the country needed cohesive policies most, infrastructure and industry were developed recklessly and with little regard for the future of China.

What is most striking is that even though China is living in an age where they could use technology to help in industrialization, they prefer a course similar to that of Western nations during the 19th century.[25] A majority of their economy runs on coal power, little to no workers' rights exist, and there are unregulated working environments. However, the major difference between the two is that China has to support a population of over 1.3 billion people. In order to modernize and raise the standard of living, this resource-poor nation has to import its supplies from elsewhere and their unregulated industrial practices are contributing to a potential environmental catastrophe. If China does not recognize its need to change its practices and policies, it may systematically and single-handedly destroy the nation it has created.[26]

It is how China handles its relationship with the e-waste business today that shows the multitude of problems nationally and internationally. It obtains this waste from two sources: internally, through production and consumption, and from the West. Because China is the largest producer of electronic goods, they also have a large amount of excess waste produced during manufacturing.[27] As the standard of living continues to rise in China, more people will be buying more of these gadgets—further perpetuating the cycle of increased supply and demand.

Currently, much of the waste is coming from imports. The process begins in the West. These countries export production to developing nations because it is cheaper and those countries have less regulation. As part of this process, China ships the new products back—the production of electronics is a major contributor to the growth of the Chinese economy. What is occurring now is the West has decided to use the same strategy for dismantling hazardous waste as they do for producing it originally. These Western nations seem to be exporting the industries that are expensive and heavily regulated and leaving it up to developing nations to clean up the mess.

This occurs in part because Western governments try to implement safe business practices and strict environmental codes. Businesses are focused on making profits and limiting their expenses as much as possible. Exporting e-waste has allowed businesses to circumvent regulation. A majority of e-waste in the United State is disposed improperly anyway. Electronics have been promoted as being "green" by manufacturing companies—a baffling description considering that a many of the components are toxic to humans and the environment.[28] Most people do not know how to get rid of their electronics—most

contribute their e-waste to mountainous landfills across the country, some just hold on to these old gadgets. A small minority of people are aware that there are special recycling centers. However, still fewer people know that these recycling centers are not performing the task that they are supposed to be doing.[29] Much of the e-waste is surreptitiously shipped across the Pacific, into Hong Kong, where it is then moved into the southern provinces of China.

The poor villages in these provinces have replaced old industries with the e-waste business. When this practice of shipping waste began to pick up steam, local authorities found that there was money to be made in the breakdown of e-waste. Villages in Guiyu and Taizhou have been rapidly transformed into digital wastelands—mountains of electrical and electronic components that have been stripped down and tossed aside, tiny particles litter the street, the town's water supply turned into a putrid smelling sludge.[30]

The e-waste business will continue to flourish. Labor is scarce in the northern and western parts of the country. Farmers are unable to provide for their families solely on their income.[31] They are forced to migrate to the cities in eastern provinces. Because they are desperate for work they will take on any job. A village like Guiyu has a native population of 150,000 and over 100,000 migrant workers who help disassemble electronics.[32] And it is not only the poor migrant workers that need the e-waste—China has come to need it too. Originally, e-waste was disassembled for its valuable components. Now, the breakdown of e-waste has become necessary because China grossly lacks the resources needed for building infrastructure or manufacturing goods.[33] E-waste contains valuable materials such as cooper, silver, gold, steel, and a variety of other recyclable materials. By breaking down e-waste, China is able to get some of the needed resources.

Obtaining these pieces of scrap metal comes at a huge cost to the environment and the people working in the industry. The practices used to dismantle these gadgets are primitive at best.[34] Some parts are smashed or dissolved in acid baths, but incineration is most common. This dismantling is occurring on the streets next to where people live and children play. Incineration increases the environmental impacts of these toxic products, made up of heavy metals, plastics and other dangerous chemicals. By burning the e-waste, it breaks down faster but also releases toxins and cancer-causing by-products into the air.[35] Anything left that is not valuable gets dumped away from the village, polluting the water. In Guiyu, water must be shipped from over 20 kilometers away.[36]

The toxins also leach into the soil and contaminate the food supply. The local authorities do not provide a safe working environment for e-waste dismantlers. Cooking occurs in the open air or in unventilated areas where workers wear little to no protective equipment. Nearly everyone in these e-waste dumpsites works in the business—men, women, and children. Workers can bring these toxins home, putting their families in contact with these harmful substances, because it clings to their skin and clothes.[37]

Because so many come in contact with the e-waste business one way or another, a majority of the inhabitants of villages like Guiyu are suffering from life-altering health issues. Many workers develop cancer. Respiratory and renal diseases are common. Infertility and birth defects are also alarmingly high. The level of lead in the blood of children is 80% higher than commonly accepted.[38] As amounts of e-waste shipped to China increase, more villages will be transformed into landfills and more people will have to get involved in the breakdown. Because e-waste disposal is not isolated to China, the increase in consumption of digital products could lead to more dump sites around the world, causing more pollution with more people affected by it.

The e-waste problem is not perpetuated by the lack of regulation. In 1995, the Basel Convention banned the trade of hazardous waste between countries.[39] This made practices like e-waste dumping illegal. The central government has passed a variety of policies on the environment and e-waste in response to international pressure and negative media coverage.[40] Despite there being internal and international policies on e-waste, they seem to have exacerbated the issue.

Beijing is trying to take steps toward reversing its environmental problems, the internal power struggle between the central and local government rages on. The dismantling of e-waste has proven to be lucrative—the local governments do not want to give up the profits in exchange for better and safer business practices.[41] In response, Beijing has tried to gradually reverse the problems it created several decades ago, implementing fines and creating regulatory committees. Both tactics have proven to be ineffective. Local officials are more willing to take on fines because they are lower than the cost of building safe recycling centers and outfitting them to meet environmental codes.[42] The regulation committees are supposed to help enforce Beijing's policies. Ironically, the central government puts the local governments in charge of "funding, approving promotions, and allocating resources and personnel."[43] Because the local officials control the money, they can

manipulate these groups and render them entirely ineffective. Therefore, e-waste continues in the country primarily because local officials refuse to cooperate with the central government's policies.

It appears that the largest problem for China in its quest to resolve its environmental problems is the local officials.[44] The central government has provided no incentive for them to change their ways and there are no real repercussions for not following the laws. While Beijing feebly attempts to exercise its power, the local authorities develop new ways to bypass restrictions: cover-ups, misreporting, and lax enforcement. The two realms are constantly resisting the other, and this is all to the detriment of the Chinese people.

What the local governments do not realize is that they can only ride the wave of economic success for so long before the people become disillusioned about the government and the country's economic structure. This social dissent is already occurring.[45] The economic growth has only affected a minority of the population, while the rest remain desperately poor—less one percent of the population holds over sixty percent of the wealth.[46] The perpetuation of the e-waste business shows how little regard the Chinese government has for the people who help contribute to its growth and development.

Ultimately, it is difficult to determine exactly how serious Beijing is about resolving this e-waste problem. The Chinese government continues to uphold the importance of economic growth.[47] However, unlike the local governments, the CCP has recognized that with economic reform, they must also implement political reform in order for the country to continue to progress.

The amount of e-waste will continue to grow regardless of how we decide to dispose of it. Since the mid-1990s, there has been an increase in importance and need for technological gadgets. As more countries like China modernize, there will be an exponential growth in consumption of these goods and more e-waste to deal with. It should be obvious that from the case study of China that the consequences of this phenomenon can be catastrophic, and that current system of e-waste disposal is not working. Post-industrial nations will have to come to terms with the reality that issues they do not want to deal with cannot be exported to some far away land and be forgotten about. Nor can nations think that implementing new laws and regulations will fix broken practices—the e-waste problem is bigger than that.

There is no quick fix for this e-waste dilemma. It requires an overhaul of a complex system. It seems that the current global economic system

has run its course and it is time for a change—one in which people and the environment take precedence over economic growth. Until our priorities change, the e-waste problem will become an even larger and more catastrophic issue than it is today.

Globalization in effect hides the gravity of the e-waste trade. Because manufacturing, production, consumption and disposal all take place in different areas, it is hard to see the true consequences of such a trade. As countries in the global South become more prosperous, more digital and electrical goods will need to be produced. The populations of countries in the global South are much larger than those in the global North. As more people can afford these technological gadgets, there will be an increase in e-waste, which will either have shifted to a new set of developing countries or more countries will have to participate in the disposal of the trade. In the meantime, environmental issues are non-discriminatory— they do not stay within the borders of those countries that participate in e-waste disposal. Pollution offset by this trade can affect other goods that countries of the global South produce, and these goods are shipped all over the world. Therefore, the e-waste trade does not just affect one country or one region. Because of globalization, what happens in one city, one country, one society can impact the entire world because of the interconnectivity that it has created.

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