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Implications of the Global Political Economy on Vulnerability to Disaster: The Case of Long-Term Structural Adjustment Policies in Nicaragua

Marcy Gerulis-Darcy, Phd.

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Abstract:

The heavy burden of disaster does not fall disproportionately on the developing world because the geological events causing disasters are stronger there. Instead, heightened vulnerability is due in large part to economic development based in structural adjustment policies (SAPS) that are unsustainable and inherently unstable. For instance, the models of economic development established by poor countries such as Nicaragua tend to follow the SAP-based agro-export trajectory, wherein economic development requires a shift from localized subsistence-based economies to growing cash crops for export on the global market. As the premium land is utilized for producing export crops, poor campesinos, in an effort to survive, migrate to cities or are displaced into ecologically sensitive areas. The poverty and displacement of the peasantry that results from this model of development heightens vulnerability to disaster as this displacement results in severe degradation of ecologically fragile lands.

Since well before the 1970's Nicaragua has been obtaining loans from international lending agencies which, in turn, require SAPs and austerity measures. However, despite these efforts Nicaragua remains one of the poorest and disaster-ridden countries in the world. Therefore, considering that much of the poverty and underdevelopment in poor countries such as Nicaragua stems from a high rate of dispossession and exploitation inherent in an export-oriented and disarticulated economic system, such root factors for risk to disaster should be assessed and challenged. As a result there is an urgent need to break with existing patterns that create, maintain, or enhance vulnerability to disaster. Ultimately, the primary focus for change lies in the elimination of extreme poverty resulting from SAPs and other austerity measures while promoting sustainable risk-reducing methods for economic, environmental and social development opportunities.

Implications of the Global Political Economy on Vulnerability to Disaster: The Case of Long-Term Structural Adjustment Policies in Nicaragua

The continued expansion of human activities in the world, now almost exclusively a function of the market, is straining both the limits of human adaptive capabilities and of the resilience of communities and nature (Holling 1994; Smit and Wandel 2006; Cannon 2008; FAO 2011). Economic and ecological crises grounded in particular models of capitalist development are consequently putting pressure on natural resources as a greater percentage of the population endure absolute poverty, often living off of the immediate offerings of the earth. These populations are thus finding themselves and their communities entirely dependent on the local ecosystem for the perpetuation of their communities and continued cultural existence. Consequently, the majority poor, largely through lack of reasonable alternatives for daily survival, inappropriately use or overuse the few or inadequate resources available to them, simultaneously degrading their environments and placing themselves in harm's way.

So-called "natural disaster" is seen as a regular part of life around the globe. Such disasters are viewed as "natural" because they originate from a natural geological event such as a hurricane, tsunami, tornado, earthquake, or heavy rain (Cannon 2008). A mid-year press release by the insurance company Munich RE stated that "An exceptional accumulation of very severe natural catastrophes makes 2011 the highest-ever loss year on record" (Munich RE 2011:1). Ultimately, the 820 "loss-relevant" natural events throughout 2011 left 27,000 dead with worldwide economic losses totaling $380 billion (Munich RE 2012:1-2). Over the last thirty years, as a result of such "natural disasters," more than three million people have lost their lives and hundreds of millions have been affected (meaning they were injured, left homeless or in need of emergency assistance such as food or shelter) costing the world a total of 2.58 trillion (Willis 2011).

Although many people equate a geological event with natural disaster, the study of natural disasters must go beyond the parameters of thunderstorms, floods, earthquakes, and hurricanes. Consequently, the larger concern of disaster research, from the local as well as the global perspective, should not place particular focus on how to deal more effectively with each isolated event as they occur, but instead aim to understand and interpret the interconnectedness of geological events and disaster with other social and institutional structures (Klinenberg 2002; Wisner et al. 2004; Cannon 2008). Therefore, a more thorough approach to the study of natural disaster must utilize and supply evidence that there is more to the severity of such disasters than the random chance of extreme climatic events. To understand disaster it is necessary to study the interaction between human behavior and nature, the relationship between people and their environment, and the ways the physical event interacts with social, political, and economic factors. Thus, the study of disasters provides a laboratory for testing several important theoretical and practical questions about human behavior

including not only questions concerning disaster mitigation, but about people's relationship to their environment and about connections between human behavior, economic systems, and political economy (Devoli et al. 2007; Cannon 2008).

This paper aims to theoretically examine various sociological factors driving geologically-stimulated disaster. In order to do so, this paper introduces Nicaragua as a case study of neoliberal-based models of development and the role played by corresponding policies in creating the conditions for social, economic and ecological crisis. By doing so, this paper argues that the state of the contemporary international political economy is a stimulus for "natural" disaster and requires a multi-dimensional analysis of the social structural causes of disaster. Thus, by addressing the political and economic environment within which political, economic and ecological development takes place, it is argued that the political economy of the globalized neoliberal economic system has a direct impact on vulnerability to disaster which often occurs from pre-existing social structural conditions–not simply an extreme natural or geologic disruption or weather event.
The methodological approach utilized throughout this paper focuses on the social, economic, political and ecological production of deprivation and disenfranchisement while offering a case study of economic development in Nicaragua in order to illustrate the ways in which diverse actors and institutions are implicated in the production disaster that they, in turn, experience collectively. This paper, therefore, aims to illustrate that the vulnerability and ensuing disaster throughout Nicaragua resulting from hurricane Mitch in 1998 was grounded in crises of political and economic disenfranchisement and environmental degradation that were decades in the making. Moreover, this paper seeks to demonstrate that disaster in countries such as Nicaragua is not inevitable with each passing hurricane (or other geological phenomenon), but instead that disasters are socially-produced. Using a sociological lens this paper aims to reveal how the inequities associated with existing political and economic development policies are often magnified by practices grounded in neo-liberalism and austerity measures which have the potential to detract from the creation of sustainable and equitable development, and thus, protection from disaster.

Exploration of Vulnerability and Resilience

As humans continue to propagate and settle into every part of the globe, environmental features and geological processes such as earthquakes, hurricanes and floods must be recognized as realities of social life. Although the geological event is only the trigger that might or might not unleash a disaster, it is often the phenomenon of vulnerability that determines the extent of a disaster. Thus, in order to explore various theoretical questions concerning "natural" disaster a thorough analysis of disaster must commence with an examination of socially-produced vulnerability and resilience−which may or may not determine the potential and magnitude of damage and recovery in times of crisis.
Vulnerability is seen as a dynamic property of a system in which humans are constantly interacting with the biophysical environment. In the most direct sense, this mutual construction of human habitats and the environment provides a theoretical basis for the assertion that we construct our own disasters insofar as

disasters occur in the environments that we produce (Bankoff, Frerks, and Hilhorst 2004). The Intergovernmental Panel on Climate Change (IPCC) states that vulnerability is the degree to which social and environmental systems are susceptible to and are unable to cope with adverse effects (Schneider et al. 2007). Here, vulnerability is expressed in terms of the stress to which a system is exposed, its sensitivity, and its adaptive capacity to perturbations or external stresses. Exposure represents the nature and the degree to which a system experiences environmental or socio-political stress as well as the magnitude and frequency of the stress experienced by the system, community or entity. Sensitivity is the degree to which a system is modified or affected by perturbations and describes the impact of stress that may result in the reduction of well-being due to a crossover of threshold (below which the entity experiences lower well-being). Adaptive capacity is the ability of a system to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope. Moreover, adaptive capacity represents the extent to which an entity can modify the impact of a stressor to reduce its vulnerability.

The concept of resilience has contributed to the study of vulnerability as it assesses a variety of stresses and shocks that act on and within social and ecological systems. Holling and others describe resilience as the ability of individuals, households or communities to anticipate, cope with, resist and recover from the impact of the natural event or disturbance as well as having the capacity to reorganize while undergoing change so as to preserve structure and function of the pre-disturbed state. That is, the ability of the system not to be overly affected by the event or disturbance. If resilience is to be considered in this way, they postulate, then vulnerability and resilience are reciprocal terms wherein a more vulnerable system should be less resilient, and a system is less vulnerable if it is more resilient (Holling 1973:14; Walker, Holling, Carpenter and Kinzig 2004). Thus, resilience focuses on understanding processes of change and on the underlying factors that allow natural and social systems to absorb and cope with disturbances and that a given ecological and social state will persist despite such shocks and stresses (Segnestam et al. 2006). As a result, a wider focus on the political and socio-economic factors involved in disaster and risk reduction will reveal that while the natural phenomena that trigger disasters are in most cases beyond human control, vulnerability to, and resilience from, disaster is generally the result of human activity which is encapsulated in broader social arrangements and power relations.

As related concepts, vulnerability and resilience offer a radical critique to the technocratic paradigm of disaster mitigation by placing emphasis on what renders a community unsafe–a condition that depends primarily upon the social order and the relative position of advantage or disadvantage that a particular group occupies within it. From this perspective, it is argued that most often a population is rendered vulnerable to disaster not simply because it is exposed to hazard(s), but as a result of disenfranchisement and exploitation inherent in the larger social system within which the community functions. According to Wisner et al., “vulnerability is a combination of characteristics of a person or group, expressed in relation to hazard exposure which derives from the social and economic condition

of the individual, family, or community concerned" (2004:60-1). Globally, those who are politically and economically marginalized are most often physically relegated to slums and shanty towns, or to arid or forest ecosystems, and are meanwhile of marginal importance to those who hold political and economic power. As a result, poor people in poor states are the most vulnerable to natural hazards and the least able to cope with them. This marginality is often exacerbated by the combination of a set of variables such as socioeconomic class, status, ethnicity or race that affects people's entitlement and empowerment and, thus, their overall command of basic necessities and right to safety (Erikson 1976; Klinenberg 2002; Wisner et al. 2004; Segnestam 2006).

An emphasis of historical processes and the dynamic nature of vulnerability broadens the scope of vulnerability analysis to examine the underlying processes that render populations vulnerable. Here, the focus is among indicators such as wealth, diversity, participation, equity and equality and highlights the critical role played by institutional policy and social capital in individual and group vulnerability. In this case, vulnerability is determined by existing inequities in resource distribution that are based in historical patterns of social domination and marginalization (Segnestam 2006; Cannon 2008). The roots of vulnerability are, thus, embedded in the social, political and economic institutions and organizations that govern the relationship between the social and ecological systems on which people depend (Erikson 1976; Bohle et al. 1994; Faber 2008; Dong et al. 2011). Cannon (1994; 2008) argues, moreover, that social processes, such as political and economic systems, generate unequal exposure to risk by rendering some people more prone to disaster than others and argues that these inequalities are largely a function of the power relations operating in every society. Critical to discerning the nature of disasters, then, is an appreciation of the ways in which human systems place people at risk in relation to each other and to their environment. This relationship can best be understood in terms if an individual's, a household's, a community's, or a society's vulnerability.

Differential Vulnerability

According to former Secretary General of the United Nations, Kofi Annan, "Ninety percent of the disaster victims worldwide live in developing countries where poverty and population pressures force growing numbers of poor people to live in harm's way…" He continues, "The vulnerability of those living in risk prone areas is perhaps the single most important cause of disaster casualties and damage" (Kahn 2005: 271). According to the International Federation of the Red Cross and Red Crescent Societies, of the 640 disasters reported for 2010, 232 (or 36 percent) occurred in what are classified as "medium human development countries" compared to 159 (or 24 percent) in "low" and 94 (15 percent) in "very high human development" countries. Among the casualties reported, 1,253 (or .01 percent) occurred in "very high human development" countries as opposed to

16,541 (or 20 percent) which occurred in “medium” human development countries (IFRC 2011:209).

According to Kahn, “65% of world deaths from natural disasters between 1985 and 1999 took place in nations whose incomes were below $760 per capita” (Kahn 2005:271). In the case of Bangladesh, for example, which holds a GDP per capita (PPP) of $1,700 (although higher than the total examined by Kahn) the annual average total count of disasters between 1980 and 2002 was 6.3 with the annual average total deaths per million people at 65.9. Conversely, the United States holds a GDP per capita (PPP) of $48,100. Meanwhile, the annual average total count of disasters during that same time period was 17.96 with the annual average total deaths per million people standing at 1.33 (Kahn 2005:272; CIA 2012). Through cross-cultural quantitative analyses of seventy-three nations, Kahn concludes that richer nations experience less deaths resulting from natural events and consequent disasters. He claims, furthermore, that “if a nation with a population of 100 million experienced a GDP per capita increase from $2,000 to $14,000, that nation would suffer 764 fewer natural disaster-related deaths a year” (Kahn 2005:283).

Research on the social impacts of natural hazards has identified commonalities between hazards, risks and different abilities of individuals or communities to absorb and cope with perturbations. As discussed above, the heavy burden of vulnerability and disaster does not fall on the developing world because the physical events causing disasters are stronger there or have changed significantly. Instead, the massive toll is due in large part to policies of development and land-use practices that are unsustainable and therefore inherently unstable. For instance, the models of economic development established by poor countries, such as Nicaragua, that promote austerity measures as a requirement of multilateral lending agencies often follow the neo-liberal, agro-export model of economic development, which requires a shift from subsistence-based economies to growing cash crops for export on the global market (Segnestam 2006). Moreover, the adoption of austerity measures instituted by multinational lending institutions aims to promote capital mobility through a reduction in the barriers to trade (Faber 2008; Shandra, Shircliff, and London 2011). This is achieved though unregulated competition which requires market liberalization, reductions of import and export tariffs, government deregulation, privatization of previously public goods and services, as well as establishing and perpetuating international financial institutions such as the WTO, World Bank, and the IMF, and free-trade agreements such as NAFTA. These measures are put in place to control government spending which interferes with the profit-maximizing dynamic of unregulated economic activity (McMichael 1996). In order to obtain loans from international lending institutions such as the World Bank and the IMF conditions for new loans require that borrowing countries agree to “structural adjustment” programs. The following outlines some of the basic requirements of such programs (Robbins 2005):

- Drastically reduce government expenditures and subsidies on government-funded services such as health, education and welfare in order to control inflation and gain more capital for repayment of loans.

- Privatize state enterprises while deregulating policies such as worker health and safety and environmental protection in order to distribute resources through the free market.

- Cut wages or constrain their rise to reduce inflation and make exports more competitive and make exports more competitive.

- Liberalize imports to make local industry more efficient and instituting incentives for producing for export markets. This is seen as a source of foreign exchange and as a more dynamic source of growth than the domestic market.

- Remove restrictions on foreign investment in industry and financial services to make local production of goods and the delivery of services more efficient.

- Devalue the local currency relative to hard currencies such as the dollar, in order to make exports more competitive.

Such structural adjustment program guidelines rearrange the economic and social structure of debtor countries in order for them to finance necessary expenditures by directing scarce capital where it is most effective and therefore where it yields the highest returns, including repayment of the loan in a timely fashion (Stiglitz 2002). These arrangements are viewed by multinational lending agencies as generating efficiency thereby resulting in an upward mobility for all. However, many scholars as well as citizens view these measures as further impoverishing debtor countries since structural adjustment calls for decreased expenditures on social safety-nets such as medical, educational and environmental expenditures. These cuts in spending include reductions in government subsidies coinciding with an increase in interest rates making it more difficult for domestic producers to compete against better-equipped and capital-rich foreign suppliers, thereby closing businesses, displacing farmers, and driving people onto marginal lands or into already overcrowded urban areas to look for work The poverty and displacement of the peasantry that results from this model of development heightens vulnerability to disaster as this displacement results in severe degradation of ecologically fragile lands (Shandra et al. 2011). As land becomes more vulnerable, so do the people. Such disarticulation, therefore, creates extra demands on the resources of the newly settled areas leaving them vulnerable to

natural phenomena thereby disproportionately placing the burden of disasters onto the shoulders of the impoverished popular majority (Martinez-Alier 2002).

Historical Record of Economic and Ecological Exploitation in Nicaragua: Creating the Conditions for Crisis

With its vast freshwater lakes, rainforests and magnificent volcanic mountains, Nicaragua is a land of spectacular scenery. However, Nicaragua is also a place of poverty, violent natural disasters, political instability, imperial invasions, dictatorial repression and inspiring revolutions. In order to more fully grasp the current political, social and environmental crisis in disaster-prone places such as Nicaragua, it is necessary to consider the underlying political and economic forces that are operating on a global scale. The pursuit of an economy dependent upon the exploitation of natural resources and labor at the expense of the overall welfare of the nation's people and environment have roots that extend back to the era of Spanish colonization. These processes intensified greatly after World War II, and culminate as today's neo-colonial economic system.

Early Coffee and Export Boom: 1800s-1900s

Between 1860 and 1878 international coffee prices began to skyrocket. Because the cultivation of coffee was well-suited to the lush vegetation located on the cool upper slopes of Nicaragua's volcanoes and central highlands, the departments of Matagalpa and Jinotega were soon acquired by 200 foreign interests. During this time 42,500 acres of "vacant" land were privatized (Rocha 2001). Compared to the forms of export agriculture that would follow, the cultivation of coffee was relatively benign ecologically. For instance, the soil was not subject to intense tillage and a canopy of trees was retained to provide shade for the coffee plants. Nevertheless, coffee cultivation had major indirect impacts as peasants were displaced en masse thereby creating an "agricultural frontier" in places such as Jinotega and Matagalpa. Meanwhile, those displaced peasants came to labor in those coffee plantations for a wage. The coffee boom therefore initiated a model of development based on agricultural exports that would benefit a few wealthy entrepreneurs in Nicaragua and abroad. This model of functional dualism would be replicated numerous times throughout the following century (and into the present day) with devastating effects for the peasants and the ecology of Nicaragua (Faber 1993).

For instance, for its livelihood, the popular majority of Nicaragua depended upon sustainable natural resources wherein the settled peasantry labored on small familial subsistence plots of land. However, the export-driven model of development adopted by Nicaragua required access to the most nutrient-rich soil and resources. Consequently, peasant lands were cleared to make way for the large-scale production of non-traditional export crops such as coffee. Those who were unable to purchase the lands that they had traditionally used for subsistence agriculture were evicted. After being stripped of their traditional landholdings, the

rural majority were left to relocate to urban areas or precarious, nutrient-poor, lands such as forest land or steep hillsides, both of which were unsuitable for traditional agricultural practices (Faber 1993).

It was during this period that Nicaragua's economy became almost totally dependent upon U.S. and foreign investment. Its status as primarily an agricultural exporter to the emerging global economy kept Nicaragua in a permanent state of underdevelopment, wherein, at one point over 90 percent of its exports were destined for the US (Merrill 1994).

Cotton Export: 1950s-70s

Like the coffee boom, which led to extensive deforestation in Nicaragua's central highlands, the next great boom crop, cotton, had an enormous effect on the country's pacific coastal plain. Before the cotton boom, the fertile coastal plain was renowned for its citrus and avocado orchards as well as being used for cattle ranching and shifting cultivation practices by peasants. Between 1952 and 1967, however, cotton production expanded by 400 percent (Faber 1993:89). Promoted and facilitated by massive loans from the U.S. Agency for International Development (USAID), the World Bank and the Inter-American Development Bank, by 1964, cotton had become Nicaragua's leading export. These loans allowed for extensive road-building and technical inputs, such as pesticides and small planes from which to spray them. By 1977, under Anastasio "Tachito" Somoza, cotton fields blanketed 89 percent of the pacific coastal plain's arable land. The postwar agro-export economic system was a new Golden Age, thus creating a nascent industrial bourgeoisie for the few wealthy families with ties to Somoza (Williams 1986). However, despite the successes in agriculture, the region's soil, water, wildlife and human inhabitants were seriously contaminated with pesticides. By the 1970s, only two percent of Central America's original tropical dry forests remained forcing former subsistence campesinos to migrate elsewhere and clear new lands or try to find wage labor while adapting to life in shantytowns and urban slums (Brockett 1988:42-44; Faber 1993:89).

Cattle Export: 1960s-70s

Until 1960, cattle ranching in Central America existed principally to feed beef to Central Americans. However, between 1960 and 1979 beef production doubled throughout Central America with the United Sates being its principle destination. In the 1970s alone, Nicaragua exported more than half of its beef products to the United States. By 1979, the US purchased 90 percent of all Central American beef exports totaling 126,318 tons, representing almost fifteen percent of all US beef imports. The main incentive for this burst of production for export was due in large part to the ever-rising demand in the developed industrial nations, mainly the United States, for cheaper meat. As beef production in Central America leaped astronomically in pursuit of the lucrative export market, average per capita beef consumption by the people of Central America plummeted. Between 1960 and

1979, while US beef consumption maintained an upward trend of 132 pounds per person, the average Nicaraguan consumed only 13 pounds by 1978 (Faber 1993).

By the late-1970s, the cattle boom would prove to be the most devastating agricultural transformation in all of Central America (Jarvis 1991; Faber 1993:119). As with the earlier cotton boom, the cattle boom was funded by foreign capital which provided money for better breeds of cattle and pasture grass, fences, roads, bridges, trucks, slaughter houses and meat-packing plants. Thus, the central highlands of Nicaragua emerged as the most important for cattle ranching, consolidating large landholdings into the hands of a few large owners. Consequently, forest cover in the region dropped from 30 percent to just five percent (Faber 1993:119). Meanwhile displaced peasant families added to the deforestation as they cut and burned virgin rainforest, clearing fresh subsistence plots on which to grow corn and beans for their survival.

Revolutionary Political and Economic Transformation in the 1980s

Despite the postwar Golden Age being experienced by the Somoza-based wealthy elite, the consequences for the rest of the population, still heavily rural, were disastrous. Agro-exports expanded at the expense of localized food production. While beef exports climbed, per capita meat consumption declined (Dunkerly 1988:194-95; Faber 1993). The dramatic expansion of both cotton and cattle created massive displacements of the rural population of a magnitude unseen since the days of the coffee boom. This is due in large part to the new agricultural and industrial systems which were more capital–and less labor–intensive then the systems they replaced. In the interim, unemployment increased dramatically as landed elites cleared so-called “unproductive” serfs and “squatters” from their newly claimed lands and replaced payment in subsistence rights and kind with cash wages and rents (Durham 1978; Williams 1986). This massive displacement of the rural population from the land created two working classes–a semi-proletariat of part-time wage laborers, renters and subsistence farmers, and an urban informal sector of petty merchants, artisans and day laborers. In many cases, the two classes converged into a great mass of desperate people with no firm ties to the labor market, the institutions of property or the societies of which they were a large majority (deJanvry 1981:36; Dunkerly 1988: 210; Faber 1993).

It was the convergence of angry farmers in Nicaragua displaced by the expanding export-based ranch economy with the growing classes of unemployed and underemployed rural semi-proletarians and urban informal sector workers that would unite to form the vanguard of the popular “Sandinista” insurrection that would bring down the Somoza dynasty (Vilas 1986). Angry and frustrated with the unequal distribution of wealth and deteriorating economic and environmental conditions in rural Nicaragua, the Sandinistas’ eclectic revolutionary doctrine advocated a mixed economy, political pluralism, non-alignment and coalition-building. The movement and its ideas were broad enough to include exploited workers, peasants and campesinos, anti-Somoza nationalists, students and even

progressive sectors of the bourgeoisie (Gilbert 1988:20). This revolutionary upsurge of the "pobretariado," or the land-poor, impoverished, semi-proletariat, and the rise of the National Sandinista Liberation Front (FSLN), represented the greatest challenge the landed coffee, cotton and cattle elite had ever faced.

The end of the dictatorship came in January 1978 when the regime murdered Pedro Joaquín Chamorro, an anti-Somoza editor of La Prensa newspaper. After many other rebellions throughout Nicaragua over the following year, Somoza finally fled to the United States on July 17, 1979 (Faber 1993). In the time leading up to the revolution, the social, political and economic state of Nicaragua was in a state of crisis. With a population of two million in 1972, Nicaragua had fewer than 1,000 doctors and fewer than 500 nurses. Between 1971 and 1975, 57 percent of children under five were malnourished (IDB 1978). At the time of the revolution in July of 1979, half of the population of Nicaragua lived in a state of absolute poverty (World Bank 1980:3). Half of the population was illiterate (the figure was much higher in rural areas at 70 percent) (Envío Team 1982). Life expectancy was around 55 years (IACHR 1981). In terms of basic public services, 87 percent of the population of Managua–the most developed city in the country–lacked one or more basic municipal services, such as running water, electricity, paved roads or adequate sewers. In fact, 80 percent of the population had no running water and only one house in ten had a decent roof (IACHR 1981). With an estimated 50,000 dead and 600,000 homeless due to the insurrection, the country was in ruins.

Considering the immediacy of the situation, the newly installed Sandinista government instituted radical social, economic and environmental changes right away. The implementation of the revolutionary Sandinista plan proved to be successful at the outset due in part to the positive economic growth that stemmed from the political and economic reconstruction after the war. Within two weeks of Somoza's downfall, government spending had been completely restructured. Instead of utilizing loans form the World Bank and IMF and cutting back on spending for social services, outlays for social services doubled from 16.1 percent of the budget in 1978 to 28.6 percent by 1982 (IACHR 1981). Immediately, many strategies were adopted to promote more sustainable and equitable forms of economic, social and ecological development while simultaneously minimizing the widespread poverty that was of epidemic proportions throughout the country. The Sandinistas argued that the nature of the conditions of economic exploitation and environmental degradation in their country were interrelated, and therefore, comprehensive economic, social, political and environmental transformations were necessary to overcome continued political and economic crises in Nicaragua. For them, it became necessary "to engage in processes of social planning and development which …. [was] dedicated to eliminating the root causes which *produced* such [crisis] in the first place" (Faber 1999).

Revolutionary Nicaragua implemented an array of innovative policies and projects which directly addressed the country's ongoing political, economic, social and environmental impoverishment. The major focal points of this national reinvention were:

- social (and environmental) justice

- promotion of national sovereignty and self-determination
- sustainable development
- democratization of resources
- (Harris 1987; Henson 1990; Faber 1999)

These policies were instituted in order to break the cycle of dependence, poverty and ecological crisis facing Nicaragua after more than forty years of Somoza-promoted neoliberal and loan-based political, economic and ecological policies. The first, "social (and environmental) justice" included programs of rights for all citizens such as the right to a clean and sustaining environment, quality health care, education, nutrition and shelter–all things which are necessary for proper human development and maintenance.

The promotion of national sovereignty and self-determination was implemented in order to create an economy less dependent loans and structural adjustment measures aimed at promoting non-traditional export crops, thus making the economy less susceptible to the proclivities of the global market. Instead, the goal was to consume what was produced locally, instead of exporting such commodities and resources.

"Sustainable development" was a major factor in the plan to reduce poverty and underdevelopment as sustainability calls for meeting the needs of the present population while allowing the population of the future to meet their needs. That is, taking control of the destiny of these systems so as to provide economic and environmental security for the region now and into the future.

In order to implement a system of sustainable development the Sandinistas saw it necessary to democratize the country's resources whether they were political, economic or environmental. For instance, the "democratization of resources" required equitable land-use policies to sustainably utilize the resources available for local or regional production and consumption so as to limit export and import costs.

By the time the Sandinistas came in to power, it was widely recognized that both the poverty of the nation's masses and the destruction of the nation's environment were due in large part to the great inequality of land distribution resulting from an export-oriented economic system. For decades, even centuries, the trend throughout Nicaragua had been for a few wealthy landowners to increase their holdings for export products such as coffee, cotton, beef, tobacco and banana exports, while more and more of the peasantry were denied access to land necessary for sustainable, subsistence agriculture. Throughout the 1970s, large monoculture-based export plantations and cattle ranches flattened 30 percent of Nicaragua's tropical rainforests (Henson 1990:40). By 1979, one-half of Nicaragua's land was controlled by only 1 percent of the population, while the ousted dictator and his closest allies owned 20 percent of the nation's best agricultural land–a land area equal to the size of Massachusetts (LaFeber 1993:11; Faber 1993:151).

Beginning in 1979, however, utilizing the four points of national reinvention, the newly installed government promoted social change throughout Nicaragua. By

1982, they succeeded in reducing illiteracy from 50.35 percent in 1979 to 12.07 percent by 1981 (Envío Team 1982). In the 1970s, the health budget represented 6.1 percent of spending whereas by 1980 such spending represented 13.8 percent of the total state budget–making health care free and accessible to all Nicaraguans (IACHR 1981; Envío Team 1982). By mid-1981, five hospitals and 44 health centers were under construction and by 1984, 17 new hospitals had been built, for a national total of 54–up from 37 in 1978 (Envío Team 1982; Henson 1990:40). In 1978, unemployment stood at 14.5 percent in Nicaragua thus, the entire government apparatus was revamped to benefit working people throughout Nicaragua (IACHR 1981). By December of 1980, more than 110,000 new jobs were created of which 50,000 were in the agricultural sector (IACHR 1981). In addition to these changes, the government enacted the Agrarian Reform Law that nationalized all rural properties owned by the Somoza family or people associated with the Somozas, representing a total of 2,000 farms encompassing more than two and a half million acres. These farms became state property under the new Ministry of Agrarian Reform (IACHR 1981; Envío Team 1982). This action, as well as a series of land reforms, was undertaken in an attempt to reverse the historical trend of inequitable land distribution and ownership. The redistribution of land previously held by the wealthy few resulted in a plethora of cooperatives and state farms provided for subsistence agriculture. In all, the government land reforms gave "private and cooperative land titles covering nearly 5.2 million acres, over one-third of Nicaragua's farmland, to about 120,000 peasant families–more than half of the country's peasant population" (Faber 1993:158). In addition to enabling more of the rural population to meet their own subsistence needs, the stability provided by small-scale land ownership also encouraged more responsible land-use practices such as terracing and reforestation to reduce soil erosion. Moreover, as peasants received secure access to land, the incentive for rainforest destruction was cut by half between 1979 and 1985 (Faber 1993:161). By 1987, land once exclusively dedicated to cotton production, the most destructive of export crops in the region, was cut from 210,000 to 60,000 hectares (Henson 1990:41).

While these programs "initially proved successful," Faber argues it was the "devastating impacts of US-sponsored economic and military aggression" that were the "primary social and political forces responsible for the revolution's eventual failure" (Faber 1999:47). Many of the Sandinistas' most progressive polices and projects had to be abandoned during the US-funded military struggle and trade embargo that debilitated the Nicaraguan economy in the 1980s. As a justifying ideology for the intervention and embargo, the Reagan and Bush administrations portrayed diminutive Nicaragua as a great Communist threat to Central America and ultimately the US and therefore their revolution must be quashed (Chomsky 1988).

By 1987, Nicaragua was in the grips of a severe economic crisis. As a result of the war, the country had suffered over $17.3 billion in damages (Brockett 1988:76). As a result, the government was forced to take a series of drastic measures in response to the grave economic crisis facing the country. Facing a "war economy," the country went into survival mode. Under this type of economy, major development projects as well as the expansion of social services had to be

drastically scaled back if not cancelled altogether. For instance, government subsidies on most basic consumer goods were terminated and prices allowed to rise. Some of the other funds that were still available were diverted to the rural areas in order to achieve self-sufficiency in food production. This was done primarily in order to slow the migration of people from the rural areas into Managua, where the crowded informal sector of self-employed vendors and speculators had become the largest sector of the economically active population. Despite these efforts however, the intensification of the war resulted in the urban displacement of over 250,000 peasants who essentially abandoned their cooperative plots of subsistence crops (Caplan and Conover 1986:26; Collins 1986).

By the late 1980's, many Nicaraguans felt pushed against the wall by such conditions and saw no other way to end the US-led aggression. Thus, against this backdrop of dismal poverty and fear of continued war, the Sandinistas lost the 1990 presidential election to a US-backed, conservative coalition led by Violeta Chamorro. This event concluded the war and economic embargo instigated by the Reagan administration, and thus represented an overthrow of the Sandinista government and the end of the revolutionary period of Nicaragua. Although, the Sandinista FSLN party received 41 percent of the votes, with this election the radical social programs established after the popular revolution of 1979 were all but abandoned in 1990 (Faber 1992; Faber 1993; LaFeber 1993; Rowling 2001).

Ecological Crisis Becoming Manifest 1990-1998

By March 1990, Nicaragua was the most indebted country in Central America, owing close to $4 billion to the Soviet Union and another $8 billion to Western nations as well as international lending institutions (Merrill 1994; CIA 2007). Desperate in the face of a severe decline in the standard of living due to a severe economic crisis, the Chamorro government's initial economic package embraced a set of policy prescriptions established by the International Monetary Fund and World Bank. The IMF demanded measures aimed at halting spiraling inflation; lowering the fiscal deficit by downsizing the military and public sector work force; reducing spending for social programs; attracting foreign investment; and encouraging exports (Merrill 1994).

The economic policies of Chamorro were a radical change from those of the previous Sandinista administration as the newly-elected president proposed to revitalize the economy by reactivating the private sector and stimulating the export of agricultural products. In due course, although state-owned enterprises contributed about 40 percent of the gross national product in 1990, the government initiated a privatization effort to transfer more than one hundred of Nicaragua's 350 state-owned companies to private ownership. This process included the outright sale, devolution or liquidation of assets. Indeed most state-owned enterprises were former Somoza properties, although some had been confiscated under agrarian reform from absentee owners or from the Contras. Therefore, the government

agreed to give back 124,000 acres of fifty-six rural properties provided that owners pay for improvements made during the revolution (Caplan and Conover 1986; Brockett 1988).

At this time, the new government was eager to receive foreign capital so that interest payments could be made on the country's massive existing debts. The inevitable result of this post-Sandinista, post-war scramble for land placed enormous pressure upon Nicaragua's remaining forests and other intact, or "unused," ecological niches. Therefore, Chamorro and other officials became motivated by a way of thinking that equated "economic progress" with the wholesale giveaway of natural resources. Thus, in the beginning of the 1990s, the region's forests were opened up by a number of timber concessions granted to foreign companies by the central government thereby reactivating Nicaragua's agricultural frontier as never before.

In 1996, although accused of electoral fraud, Somoza-supporter Arnoldo Alemán became president of Nicaragua. This reinsertion of the very forces that had been expelled by the Sandinistas in 1979 represented a return of the Somocistas and US Imperialism. As a result, the Nicaraguan government returned to a familiar position of complicity with the United States government and the multilateral lending agencies that held the nation's debts (Faber 1999). At this time, the external debt of Nicaragua stood at $7 billion with a total account balance of $ -493 million (WRI 2003). Thus, an important goal of the Alemán administration was to open even more of Nicaragua's nationalized industries to private bidding. Under austerity programs imposed by the IMF, the administration opened the country to foreign investors by giving foreign companies special favors, thereby commencing the appearance of the first maquiladoras for textiles and apparel ready to exploit cheap labor. This adjustment strategy provided juridical guarantees for foreign investors while withdrawing most government supports and bank loans to small farmers and marginal producers, thus subjecting all exports to the proclivity of the global market. These policies had an immediate and devastating impact upon workers and farmers as this strategy resulted in the firing of government employees and the removal of unions, consequently translating into a reduction of wages and therefore a significant loss in purchasing power for the average citizen (Merrill 1994).

Hurricane Mitch: The Culmination of Destructive Ecological Practices

Central America suffers more disasters than almost anywhere else on the globe. Five tectonic plates meet in the area covered by Mexico and Central America which result in high levels of seismic activity thereby causing frequent earthquakes and occasional tsunamis. There is also an active chain of volcanoes down the Pacific Strip dotting the entire isthmus with abrupt mountains. In addition, four cyclogenetic zones are present in the Pacific and Atlantic oceans in which there is intense activity throughout the annual hurricane seasons that run from June to November (Martínez 1999). Located within Central America, Nicaragua is one of

the most disaster-prone countries in the world. It has been estimated that the average Nicaraguan will experience 3.7 major natural disasters in their lifetime (Martínez 1999).

In the last days of October 1998, the culmination of decades-long economic, political and ecological crises became manifest throughout Central America. In Nicaragua, where the damage was most pronounced, hurricane Mitch delivered record speed winds and a rainfall total of up to 75 inches, representing three years' worth of rainfall in a few days (INETER 1998; Aleman 1999). In northwestern Nicaragua lies the department of Chinandega which consists of many volcanic mountainsides. Shortly after 10:30 am on October 30th, the southern rim of the La Casita volcano collapsed onto itself. At that time, a 330 foot-wide section consisting of some 200,000 m3 of rock and loose soil gave way, causing an avalanche of mud, water, and debris. This debris, which looks and behaves like flowing concrete, is referred to by geologists as a lahar. After traveling less than one-half mile, descending some 600 feet, the lahar was over 3,000 feet wide as it continued to gain velocity en route down the mountain (INETER 1998; Scott 1999). The landslide engulfed everything in its path. Trees as large as three feet in diameter were uprooted and smashed into kindling by half-ton boulders in the debris flow. By the time the lahar reached the more horizontal area at the base of the volcano, it was one and one-half miles wide and was traveling at a speed of sixty miles per hour. Slowing slightly on the more horizontal surface, the lahar slowed to thirty-five miles per hour as it swallowed the villages of Rolando Rodriguez and El Porvenir one and one-half miles further down range. The torrent of debris and water continued on for another four miles proceeding to scour a channel some 1,000 feet wide and fifteen feet deep. This ended a slide that totaled seven miles in length, four miles in width, with a drop in elevation of some 1,500 feet–most of which occurred in the first one mile (Scott 1999; Barberena 2002). Ultimately, the collapse of La Casita left 2,513 people buried in a collective tomb beneath mud 6 to 18 feet thick (Scott 1999; Rocha 1999).

At the time, Mitch was the strongest hurricane ever observed in the Month of October. The hurricane also tied for the fourth most intense Atlantic hurricane in recorded history (U.S. Department of Commerce 2006). Flood waters left a trail of devastation across the whole of Nicaragua, killing 3,800, cutting off 172 villages and destroying at least 24 major roads and highways, 35 bridges and 5,066 homes. Tens of thousands were left homeless and without power or water across the country (White 1998; Oxfam International 1998). At $1.5 billion in damages Nicaragua suffered losses equivalent to half of its gross domestic product (Zarembo 1998, NCDC 2006). The destruction set back the region's infrastructural and economic base by at least 20 years, despite the fact that the country already had fallen 20 or 30 years behind 1977 growth levels as a result of the war and economic crisis of the 1980s (Richards 1998).

After the catastrophic lahar on the southern flank of La Casita in 1998, many survivors pointed their finger to blame God for this occurrence. Meanwhile, geologists, seismologists, volcanologists and hydrologists launched many differing scientific theories for the possible underlying causes of the landslide on the Nicaraguan volcano. In the years following the collapse of La Casita, most

geologists that have analyzed the lahar have asserted that following the cessation of eruptive activity of the volcano (its last documented eruption occurred 8,300 years ago), persistent hydrothermal activity continued to weaken the volcano (Vallance, Schilling, Devoli, Reid, Howell and Brien 2004).

Other geologists have noted that over the past century land cover in northwestern Nicaragua underwent fundamental changes (as outlined above). Van Wyk de Vries et al. point out that in the early 1900s La Casita was still covered with dense deciduous forest, with open pine forest and shrubs dominating at elevations above 3,280 feet. However, due to the high soil fertility, the slopes and lowlands southwest of all Marabios volcanoes became preferred for agriculture. Thus, the expansion of agricultural practices contributed to an unprecedented rate of land-use change, much of which took place at the expense of original forest cover, now considered extinct in western Nicaragua (van Wyk de Vries, Kerle and Petley 2000). Since then, land transformation, deforestation and a lack of soil conservation have made the Los Maribios volcanic chain (of which La Casita is a part) one of the most degraded landscapes in Central America. Agribusiness enterprises such as cattle ranching and cotton agriculture have contributed significantly to the increased risk of soil erosion. These enterprises, in turn, began to push farmers into subsistence plots higher on the sides of the volcanoes of the area, thus resulting in further degradation of the land on the volcano.

According to Kerle et al. (2003), such compromised structural integrity combined with anthropomorphic land cover changes, in particular progressive northward deforestation, have been linked to slope instability. These changes have had a pronounced effect on subterranean and surface layers as deforestation has made the land less permeable to promote the absorption or drainage of moisture. In fact, approximately 2.5 miles of forest between the collapse site and the cooperative settlements were cleared, paving the way for a largely unobstructed debris flow. Thus, according to Kerle et al. activities such as land clearing and related deforestation exacerbated the lahar flow and gave it a smooth, uninhibited path.
Since the lahar on La Casita, scientists continually asked *why* this happened and now, almost fifteen years later, are asking what can be done to *prevent* another avalanche not only on La Casita but on other populated volcanoes. In the case of La Casita, geologists and other scientists point to the causes of the collapse as having been in the process for many years. It simply took a large rainfall from a hurricane to act as a trigger and set in motion the largest natural disaster Nicaragua has ever witnessed. It was a disaster waiting to happen, for, if development proceeds in or near known hazards such as the flanks of volcanoes, then perhaps we should not be surprised if a disaster ensues. As long as disasters are perceived as external or independent from the framework of development in use, according to Devoli, Strauch, Chávez and Høeg, we can:

“expect an increase in frequency of recorded slides because, in recent years, more people in Nicaragua are being exposed to landslides because of increased population, the expansions of the agricultural frontiers, the high rate of poverty that forces a large population to migrate toward susceptible lands without proper planning, and accelerating deforestation from new and expanding settlements” (Devoli et al. 2007).

Because many settlements in Nicaragua are so close to volcanoes, detection of flowing lahars and a warning in time for successful evacuation are unlikely. Thus "the key to avoiding disasters like La Casita is keeping settlements out of lahar pathways" (U.S. Department of the Interior, USGS 2002).

Social Scientific Analysis of Disaster

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According to Vukelich (1999) "loss is a constant in the Nicaraguan population." As a result, the application of new technologies and strategies to protect lives, livelihoods and property within societies experiencing dynamic change are key areas of work for the scientific and technical communities. Indeed, science and technology play key roles in monitoring hazards and vulnerabilities, developing an understanding of their continually changing patterns and developing tools and methodologies for disaster mitigation and risk reduction. Moreover, natural scientific approaches are helpful in explaining, for example, the natural geological processes of hurricanes in terms of their instigation, velocity and trajectory. Moreover, various efforts directed at reducing the impact from hurricanes have focused on forecast, warnings and evacuation and on improved construction for reducing damages. Such techniques have proven highly effective in reducing loss of life in developed countries. However, poor countries often lack the resources necessary for improved construction techniques, warning systems and successful methods of evacuation. Consequently, loss of life in such places is actually increasing (IFRC 2010). Thus, limitations of science and technology in responding to the fundamental problems of producing and managing risk factors need to be carefully considered. An over-concentration on technical solutions at the expense of an analysis of the human aspects that compose the economic, social and political dimensions of societies will continue to provide disappointing results in effective or sustained commitments to risk reduction. Thus, outlays for extreme weather events to be observed, measured and broadcast to the public in times of crisis abandons analyses concerning the connections between (mal-)development, poverty, ecological crisis, population density and disaster.

By understating the extent of storm damage and offering quick repairs or cosmetic solutions to damaged property, fundamental flaws in the status quo go unremedied, class divisions are maintained and unsafe practices continue unquestioned. Even today, with our increased scientific knowledge regarding the causes and consequences of disaster, the sociological approach argues that unsustainable development, often the result of structural adjustment and austerity measures, continues unabated in seismically active areas and flood-prone coastal plains (Faber 2008; Shandra 2011). Thus, scholars such as Steinberg and Klinenberg make a powerful point concerning the political economy of disaster mitigation as they examine how many of the world's worst natural disasters have been made more devastating through economic decision-making. Most of the time, they claim, these decisions protect the wealthy and commercial interests

while leaving the poor and marginalized vulnerable (Steinberg 2000; Klinenberg 2002).

Steinberg and Klinenberg explore what Steinberg coined the “unnatural history of natural calamity” (Steinberg 2000; Klinenberg 2002). They argue that the decisions of business leaders and government officials have paved the way for greater losses of life and property, especially among those least able to withstand such blows–the poor, displaced, disenfranchised and marginalized. Thus, seeing God or nature as the primary culprit in disaster, Steinberg argues, masks the fact that some groups are better protected from hazards and disaster than their counterparts lower down the socio-economic ladder.

Klinenberg (2002) recognizes that extreme weather events are indeed a regular occurrence. However, he claims, whether or not these events result in “disaster” is a product of social organization. According to Klinenberg, a disaster is an “environmentally stimulated but socially organized catastrophe” (Klinenberg 2002). Here, he views disaster as more than a meteorological anomaly resulting in damage and high numbers of casualties. Instead, he claims that it is deeply rooted in the social and institutional arrangements of society.

Hurricane Mitch was a deadly offspring of the dangerous La Niña current, which followed in the wake of El Niño. “When the storm hit, the landscape collapsed” (Goldstein and Faber 1999:A1). The rain’s effects were even more destructive due to the country’s historical imbalance between human settlements, large-scale agro-business and massive deforestation in hazardous zones. There was also the persistence of unsustainable, anti-ecological agricultural practices in the rural zones as a consequence of impoverishment and displacement. As their lands were usurped, peasants and campesinos migrated to perilous lands such as the slopes of volcanoes like La Casita. Too isolated and poor to purchase gas or kerosene for cooking, they took the ax to the timber for firewood leaving the mountainside denuded and vulnerable to erosion and landslides during the rainy season. This environmental wasteland, therefore, left little to absorb the rain in order to prevent or cushion such an avalanche of water (Devoli et al. 2007).

The lahar resulting from Hurricane Mitch not only hauled down entire villages and innumerable homes, it also pulled down the possibility of continuing to deceive ourselves with appearances. It laid bare the fragility of models of “development” and the ephemeral figures proclaiming “progress.” The damage from Mitch in Nicaragua left no way to hide the evidence that thousands of hurricane and lahar victims were already the victims of compliance to structural adjustment policies mandated by the IMF and World Bank which aim to dismantle the institutional capacities of the state while slashing budgets on so-called “non-essential” services such as sustainable agriculture and civil defense. This reduction in social spending for the purpose of lowering fiscal deficits and public expenditures affects the impoverished the most. Despite the modernization of the state that is supposed to accompany structural adjustment, the connections between poverty and vulnerability are clear.

Discussion

In its attempt to define vulnerability to disaster sociological literature focuses on past, present and future social, economic, political and ecological conditions. From this tradition, a common definition of vulnerability is:

"best described as an aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of potential harmful perturbations. Vulnerability is a multilayered and multidimensional social space defined by the determinate, political, economic and institutional capabilities of people in specific places at specific times" (Bohle, Downing and Watts 1994).

This definition uses an application of political economy and political ecology to study vulnerability. Not using biophysical hazards as a catalyst, but instead using as a point of departure social, structural and institutional arrangements that precede precarious use of the environment, this approach examines the social, political and economic processes that together explain differential levels of exposure, impacts, and capacities to absorb change from extreme natural phenomena.

"The concept of hazards as external events impinging on unsuspecting people has been shed in favour of the interpretation that they emerge from interactions between people and environments" (Mitchell, Devine and Jagger 1989). Thus, the term "vulnerability" refers not to an uncontrollable or inevitable biophysical threat, but instead to an internal risk factor of an individual or community that is exposed to a hazard and corresponds to its intrinsic predisposition to be affected by, or to be susceptible to damage. Vulnerability thus represents the physical, economic, political and/or social susceptibility of a community to damage in the case of a destabilizing phenomenon of natural or even anthropogenic origin. The analysis presented above demonstrates that the space where risk and vulnerability originate and the areas where loss is suffered are often not the same, and therefore pinpointing vulnerability is a complication that relates to time, spatial and organizational qualities. Vulnerability, thus, represents the dynamic and fluid changing of social and economic conditions in relation to the nature of hazard and is part of an evolutionary and accretive process. Vulnerability, moreover, represents a series of concentrated, and often enduring, conditions which make livelihood activities extremely precarious for certain social groups. Thus, as many communities are rendered vulnerable by models of (mal-)development resulting from disenfranchisement and marginalization, a proper appreciation of the social-construction of vulnerability is essential to any social-scientific study of disaster.

The sociological approach to the study of vulnerability raises fundamental political questions about resource access, risk exposure and opportunity to live safely and securely. Thus, an adequate historical perspective through which to understand the roots of disaster causality is essential as the consequences of the intersection of political, economic and social processes place different segments of the populace in perilous settings considerably increasing their risk of danger in times of ecologic disturbance. Vulnerability, then is not simply a property of social groups or individuals, but is embedded in complex social relations and processes.

Thus, vulnerability is a condition that is constructed, accumulates and remains over time and is directly linked to social aspects and to the model of development of communities.

A sociological analysis of vulnerability produces a more complicated argument of how poverty, desperation and ecological crisis are consequences of the asymmetrical power relationships among nations in the global world market and international political system. The foray of neoliberal capitalism into traditional societies produces ecological disenfranchisement and the progressive marginalization of the rural poor. Moreover, the emerging global political and economic system encourages the consolidation of landholdings and the introduction of technology and capital-intensive agricultural production wherein peripheral countries become specialized in an international division of labor producing non-traditional goods and cheap labor for international markets rather than for domestic needs. This economic system has damaging consequences and does little to manage agricultural lands as well as the livelihood of the popular classes in a sustainable manner. Thus, the structure of the world market and global political economy is itself a major source of the ongoing ecological crisis afflicting developing countries such as Nicaragua.

Although rich in biological diversity, the soil in Nicaragua has been degraded by decades of producing export crops for foreign appetites. In many regions, firewood that was formerly cheap and abundant is now scarce and expensive. Streams that were always used to supply water now been contaminated by runoff from cattle feedlots, large-scale crop fields or gold mines or have simply dried up due to massive deforestation, watershed degradation and local climate change. The growing gulf between the rich and the poor as well as the unsustainable use of natural resources by modern civilization has created the conditions of scarcity and consequently the latent potential for disaster that will eventually spread throughout all of the continents. From this perspective, we have much to learn by Nicaragua's worsening environmental degradation.

The situation in Nicaragua can thus be viewed as a case study, revealing a future that is quite possible for the rest of the world. Upon analysis of the political, economic and ecological situation in Nicaragua, a sobering realization emerges that deforestation, erosion and loss of biological diversity are deeply rooted in imperialism and globalized neoliberal capitalism. Thus, any quick fixes attempting to mask the symptoms that we are seeing today are essentially futile. Unless global economic inequity is drastically reduced, environmental problems, and in turn natural disasters, will only worsen.

Nicaragua is highly dependent on international markets with regard to the sale of raw materials and agricultural products, and increasingly, technology for the manufacture of commodities for export. Consequently, like many developing countries, wealth is highly concentrated among a small group of prosperous elites who co-exist alongside a marginalized and growing majority living in extreme, or absolute, poverty. In order to combat abject poverty and a lag in economic development, countries like Nicaragua have taken out loans from multinational lending institutions such as the World Bank and IMF. Under these loans a uniform

economic structural adjustment model has been applied resulting in what appears to be an improvement in macro-economic performance. However, this improved performance in the international market has been juxtaposed against a widening gap between the rich and the poor, a depression in sustenance-based agricultural production, an explosion in the urban populations, a rise in unemployment and consequently a massive out-migration of people seeking employment elsewhere. In addition, because structural adjustment packages require widespread cuts in the funding of basic services in the areas of education, housing and health-care, this has led to the rise of illiteracy, homelessness and diseases such as Typhoid, Hepatitis A and HIV/AIDS (UNDP Human Development Report 2003).

Conclusion

This research has revealed that vulnerability due to systemic neglect may be decades in the making, for, certain segments of the population are often situated in more perilous settings than others due to the historical consequences of political, economic and social processes. Thus, the principal cause of the damage done throughout Nicaragua as a result of Hurricane Mitch has its origins in the structural role played by internationally imposed development models, an overall legacy of imperialism and political corruption as well as long-term political, economic and ecological neglect. As Oliver-Smith states, "a disaster is a historical event– and the aftermath of disaster is process coming to grips with history" (Oliver-Smith 1979:96).

Despite the social gains achieved during the revolutionary 1980's, Nicaragua has experienced the fastest rate of social and economic deterioration of all of the Latin American countries in the last decade, and now is the second poorest country in the Western Hemisphere after Haiti. In 2011, out of 187 countries, Nicaragua fell to the 129th position in the UNDP Human Development Index (UNDP 2011) where almost sixteen percent of population survives on less than $1.25 a day, with some 60 percent of urban households and 85 percent of rural households classified as extremely poor (CIA 2011). With a per capita income of less than US$ 1,500 the decline in purchasing power, even for those with salaries, has been dramatic wherein a salary worth 100 units in 1980 is now equivalent to a salary of 14 units (CIA 2011).

Thus, it has been demonstrated that vulnerability lies at the intersection of different dimensions of time and space, wherein it is not just concerned with the present or the future but is equally, and directly, a product of the past. However, a proper appreciation of the construction of vulnerability is often hampered by the lack of an adequate historical perspective from which to understand the contexts and roots of disaster causality (Oliver-Smith 1986:18). Time and again, Nicaragua has borne the brunt of geological phenomena that have occurred in the region over the last four decades. Deepening poverty, rapid urbanization and widespread social and economic exclusion have frequently resulted in the population of whole areas being marginalized. The most deprived areas and social sectors are, therefore, those most at risk from natural hazards and disasters of all kinds. This is so because natural disasters detonate crises in contexts of social, political, economic and environmental instability, bringing to light a series of hidden conflicts

and potentially dangerous situations. Thus, we must seek to identify the most crucial problems of groups living in high-risk zones that make them vulnerable to, and in the end, victims of disaster.

References

Alexander, David. 1993. *Natural Disasters*. London: UCL Press.

Aptekar, Lewis. 1994. *Environmental Disasters in Global Perspective*. New York: G.K. Hall & Co.

Bankoff , Greg, George Frerks, Dorothea Hilhorst. 2004. Mapping Vulnerability: Disasters, Development and People. London: Earthscan.

Barberena S., Edgard. 2002. "A Cuatro años del Casitas Posoltega aún damnificada." *El Nuevo Diario*, October 29. Managua, Nicaragua.

Blaikie, Piers, Terry Cannon, Ian Davis and Ben Wisner. 1994. *At Risk: Natural Hazards, People's Vulnerability, and Disasters.* London: Routledge.

Bohle, Hans G., Thomas E. Downing, Michael J. Watts. 1994. "Climate Change and Social Vulnerability: Toward a Sociology and Geography of Food Insecurity." *Global Environmental Change* (4) 37-48.

Brockett, Charles, D. 1988. *Land, Power and Poverty: Agrarian Transformation and Political Conflict in Central America*. Boston, MA: Unwin Hyman.

Cannon, Terry. 1994. "Vulnerability Analysis and the Explanation of 'Natural' Disasters." Pp. 13-30 in *Disasters, Development and Environment*, Ann Varley ed. Chichester: Wiley:14-19.

Cannon, Terry. 2008. "Vulnerability, "innocent" disasters and the imperative of cultural understanding." *Disaster Prevention and Management*, 17(3), 350–357.

Caplan, Michael and Nancy Conover. 1986. "Resisting Economic Aggression:

Nicaragua's Survival Economy." *Nicaraguan Perspectives* (12):22-27.

Central Intelligence Agency (CIA). 2007. "The World Factbook." Retrieved February 21, 2007 (https://www.cia.gov/cia/publications/factbook/geos/nu.html).

Central Intelligence Agency (CIA). 2011. "The World Factbook." Retrieved December 30, 2011. (http://www.state.gov/r/pa/ei/bgn/1850.htm#econ).

Central Intelligence Agency (CIA). 2012. Central Intelligence Agency. The World Factbook.

Country Comparison: GDP - per capita (PPP).

https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html?countryName=Bangladesh&countryCode=bg&regionCode=sas&rank=193#bg (accessed January 13, 2012)

Chomsky, Noam. 1988. *The Culture of Terrorism*. Boston, MA: South End Press.

Collins, Joseph. 1986. *Nicaragua: What Difference Could a Revolution Make?*

New York, NY: Grove.

De Janvry, Alain. 1981. "Laws of Motion in the Center-Periphery Structure: The

Underlying Forces." Pp. 7-60 in *The Agrarian Question and Reformism in Latin*

America. Baltimore, MD: Johns Hopkins Press.

Devoli, Graziella, Willfried Strauch, Guillermo Chávez and Kaare Høeg. 2007. "A Landslide database for Nicaragua: a tool for landslide-hazard management." *Landslides* 4(2):163-176.

Dong, S., L. Wen, S. Liu, X. Zhang, J. P. Lassoie, S. Yi, X. Li, J. Li, and Y. Li. 2011. "Vulnerability of worldwide pastoralism to global changes and interdisciplinary strategies for sustainable pastoralism." *Ecology and Society* 16(2), article10.

Dunkerly, James. 1988. *Power in the Isthmus.* London: Verso.

Durham, William L. 1978. *Scarcity and Survival in Latin America: Ecological Origins of the Soccer War*. Stanford, CA: Stanford University Press.

Envío Team. 1982. "Nicaragua: Three Years of Achievements." *Revista Envío* (English edition). July 1982, No. 13. Retrieved February 25, 2007 (http://www.envio.org.ni/articulo/3368).

Faber, Daniel. 1992. "The Ecological Crisis of Latin America: A Theoretical Introduction." *Latin American Perspectives* 19(1):3-16.

Faber, Daniel. 1993. *Environment Under Fire: Imperialism and the Ecological Crisis in Central America*. New York: Monthly Review Press.

Faber, Daniel. 1999. "La Liberación del Medio Ambiente: The Rise and Fall of Revolutionary Ecology In Nicaragua, 1979-1999." *Capitalism, Nature and Socialism* 10(1).

Faber, Daniel. 2008. *Capitalizing on Environmental Injustice: The Polluter-Industrial Complex in the Age of Globalization*. MD: Rowman & Littlefield.

Food and Agriculture Organization of the United Nations (FAO). Adam Prakash, ed. 2011. Safeguarding Food Security in Volatile Global Markets. Rome: FAO.

Gilbert, Dennis. 1988. *Sandinistas*. Oxford: Basil Blackwell.

Goldstein, Jacob and Daniel Faber. 1999. "Damage Wasn't an Act of God but Act of Man." *Los Angeles Times*, March 11, A15.

Harris, Richard L. 1987. "The Revolutionary Transformation of Nicaragua."

Latin American Perspectives 14(1):3-18.

Henson, Dave. 1990. "Assessing Nicaragua's Green Revolution." *Earth Island Journal*. Summer 1990:40-41.

Holling, C.S. 1973. "Resilience and Stability of Ecological Systems." *Annual Review of Ecological Systems* 4:1-23.

Holling, C.S. 1994. "An Ecologist View of the Malthusian Conflict," in *Population, Economic Development, and the Environment*, edited by Kerstin Lindahl-Kiessling and Hans Landberg. New York: Oxford University Press.

Inter-American Commission on Human Rights (IACHR). 1981. "Economic and Social Rights" in *Report on the Situation of Human Rights in the Republic of Nicaragua*. June 30, 1981. Washington DC. Retrieved February 23, 2007

(http://www.cidh.org/countryrep/Nica81eng/TOC.htm).

Inter-American Development Bank (IDB). 1978. "Report on Economic and Social Progress in Latin America." Washington DC.

Instituto Nicaragüense de Estudios Territoriales (INETER). 1998. "Las lluvias del siglo en Nicaragua : El Huracán Mitch, las lluvias y otros eventos ciclónicos y su recurrencia en Nicaragua 1892-1998." Managua: INETER. Retrived March 15, 2007

(http://desastres.unanleon.edu.ni/pdf/2003/Julio/Parte1/pdf/spa/doc11443/doc11443.htm).

International Federations of Red Cross and Red Crescent Societies (IFRC). 2002. . International Federations of Red Cross and Red Crescent Societies "World Disasters Report 2002." Geneva: International Federation of Red Cross and Red Crescent Societies.

International Federations of Red Cross and Red Crescent Societies (IFRC). 2007. International Federations of Red Cross and Red Crescent Societies "World Disasters Report 2007." Geneva: International Federation of Red Cross and Red Crescent Societies.

International Federations of Red Cross and Red Crescent Societies (IFRC). 2010. International Federations of Red Cross and Red Crescent Societies "World Disasters Report 2010." Geneva: International Federation of Red Cross and Red Crescent Societies.

Jarquin, Edmundo. 1999. "This time let's do it right." IDB America, magazine of the Inter-American Development Bank, January-February 1999.

Jarvis. Lovell S. 1991. "*Livestock Policy and Development in Latin America*." FAO United Nations 1991. Retrieved February 5, 2007

(http://www.fao.org/docrep/U5700T/u5700T0a.htm).

Kahn, Matthew E. 2005. "The Death Toll from natural Disasters: The Role of Income,

Geography, and Institutions." The Review of Economics and Statistics, vol 87, No. 2 (May 2005). Pp. 271-284.

Kerle, Norman, Benjamin van Wyk de Vries, Clive Oppenheimer. 2003. "New Insight into the factors leading to the 1998 flank collapse and lahar disaster at Casita volcano, Nicaragua." *Bulletin of Volcanology* July 2003:65(5):331-345.

Klinenberg, Eric. 2002. *Heat Wave: A Social Autopsy of Disaster in Chicago*. Chicago: University of Chicago Press.

La Feber, Walter. 1993. *Inevitable Revolutions: The United States in Central America*. New York: W.W. Norton & Company.

Martínez, Arnoldo J. 1999. "Reflexiones sobre la Vulnerabilidad Nacional." *Confidencial. Semanario de Información y Análisis Politico* No. 127. Retrieved September 30, 2007

(http://www.confidencial.com.ni/1999-127/html/body_columnista_invitado.html).

Martinez-Alier, Joan. 2002. *The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation*. Cheltenham: Edward Elger.

McMichael, Phillip. 1996. "Wither Development?" Pp. 241-258 in *Development and Social Change: A Global Perspective*. Thousand Oaks, CA: Pine Forge Press.

Merrill, Tim, ed. 1994. *Nicaragua: a Country Study*. Federal Research Division, Library of Congress. Third Edition. Washington DC. Retrieved February 17, 2007 (http://countrystudies.us/nicaragua/).

Mitchell, James K., Neal Devine and Kathleen Jagger. 1989. "A Contextual Model of Natural Hazard." *Geographical Review* 79(4), 391-409.

Munich RE. 2011. "Accumulation of very severe natural catastrophes makes 2011 a year of unprecedented losses" (Press Release). July 12, 2011. Retrieved July 12, 2011. (http://www.munichre.com/en/media_relations/press_releases/2011/2011_07_12_press_release.aspx).

Munich RE. 2012. "Review of natural catastrophes in 201: Earthquakes result in record loss year." (Press Release) January 4, 2012. Retrieved January 16, 2012. http://www.munichre.com/en/media_relations/press_releases/2012/2012_01_04_press_release.aspx.

National Climatic Data Center (NCDC). 2006. "Mitch: The Deadliest Atlantic Hurricane Since 1780." US Department of Commerce. Asheville, NC. Retrieved March 21, 2007 **(**http://www.ncdc.noaa.gov/oa/reports/mitch/mitch.html).

Oliver-Smith, Anthony. 1979. "Post Disaster Consensus and Conflict in a Traditional Society: the Avalanche of Yungay, Peru." *Mass Emergencies* 4:39-52.

Oliver-Smith, Anthony. 1986. "Disaster Context and Causation: An Overview of Changing Perspectives In Disaster Research." Pp 1-38 in *Natural Disasters and Cultural Responses*, edited by Anthony Oliver-Smith. Williamsburg: College of William and Mary.

Oxfam International. 1998. "Briefing Paper: Central America after Hurricane Mitch: Will the Donors Deliver?" December, 3 1998. Retrieved March, 21, 2007 (http://www.oxfam.org.uk/resources/policy/conflict_disasters/downloads/CENTRALA.rtf).

Richards, Gareth. 1998. "Reconstruction: Wind of Change." *The Guardian*, November 18, 4.

Robbins, Richard H. 2005. *Global Problems and the Culture of Capitalism*. Boston: Pearson.

Rocha, José Luis. 2001. "The Chronicle of Coffee: History, Responsibility and Questions." *Revista Envio* (English edition). August 2001, No. 241. Retrieved February 25, 2007 (http://www.envio.org.ni/articulo/1523).

Rowling, Megan. 2001. "Nicaragua 2001." *Z Magazine* Vol. 14, No. 1. January, 2001.

Schneider, S.H., S. Semenov, A. Patwardhan, I. Burton, C.H.D. Magadza, M. Oppenheimer, A.B. Pittock, A. Rahman, J.B. Smith, A.Suarez and F. Yamin. 2007. Assessing key vulnerabilities and the risk from climate change. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 779-810.

Scott, Kevin. 1999. "Volcanic Landslides, Debris Avalanches, and Debris Flows in Nicaragua Resulting from Hurricane Mitch, October–November 1998. Recommendations for Mitigation from U.S. Geological Survey Mission of January 19-30, 1999." Managua, Nicaragua: USAID.

Segnestam, Lisa, Louise Simonsson, Jorge Rubiano and Maria Morales. 2006. "Cross-level institutional processes and vulnerability to natural hazards in Honduras." United Kingdom: Stockholm Environmental Institute.

Shandra, John M, Eric Shircliff, and Bruce London. 2011. "The International Monetary Fund, World Bank, and structural adjustment: A cross-national analysis of forest loss." *Social Science Research* 40 (1): 210-225.

Smit, Barry and Johanna Wandel. 2006. "Adaptation, adaptive capacity and vulnerability." *Global Environmental Change*. 16 (3): 282-292.

Steinberg, Ted. 2000. *Acts of God: The Unnatural History of Natural Disaster in America*. Oxford: Oxford University Press

Stiglitz, Joseph. 2002. *Globalization and its Discontents*. New York: W.W. Norton & Co.

United Nations Development Programme (UNDP). 2011. *Human Development Report 2011*. New York: UNDP.

United States Department of Commerce. 2006. "Service Assessment: Hurricane Katrina, August 23- 31, 2005." June 2006, Silver Springs, Maryland.

United States Department of the Interior , U.S. Geological Survey (USGS). 2002. "Intense rainfall During Hurricane Mitch Triggers Deadly Landslide and Lahar at Casita Volcano, Nicaragua, on October 30, 1998." Retrieved 4/20/07. (http://volcanoes.usgs.gov/Hazards/What/Lahars/CasitaLahar.html).

Vallance, James W., S.P. Schilling, Graziella Devoli, M.E. Reid, M.M. Howell and D.L. Brien. 2004. "Lahar Hazards at Casita and San Cristobal Volcanoes, Nicaragua." USGS Open-File Report 01-468. Retrieved March 27, 2007 (http://vulcan.wr.usgs.gov/Volcanoes/Nicaragua/Publications/OFR01-468/introduction.html).

van Wyk de Vries, Benjamin, Norman Kerle, Petley Dave. 2000. "Sector collapse forming at Casita volcano, Nicaragua." *Geology* 28:167-70.

Vilas, Carlos. 1986. *The Sandinista Revolution: National Liberation and Social Transformation in Central America*. New York: Monthly Review.

Vukelich, Donna. 1999. "On the Record: Central America After Mitch." The Advocacy Project–A Virtual Partnership. Washington DC. May 27, 1999. 8(9) Part 2. Retrieved March, 8, 2007 (http://www.advocacynet.org/news_view/news_147.html).

Walker, Brian and C.S. Holling, Stephen R. Carpenter, Ann Kinzig. 2004. "Resilience, Adaptability and Transformability in Social-Ecological Systems." *Ecology and Society* 9(2):5.

White, Jerry. 1998. "At least 7,000 killed by Central American Hurricane." International Committee on the Fourth International (ICFI), World Socialist Web Site. November 3. Retrieved March 5, 2007 (http://www.wsws.org/news/1998/nov1998/hur-n03.shtml).

Williams, Robert. 1986. *Export Agriculture and the Crisis in Central America*.

Chapel Hill: University of North Carolina Press.

Willis Limited. 2011. "European Natural Catastrophes Bulletin." April 2011. Willis Limited:

Property Investors Division. Retrieved February 9, 2012.

http://www.willis.com/Documents/Publications/Industries/Property_Investors/6969_European_Catastrophe_Newsletter_270411.pdf.

Wisner, Ben, Piers Blaikie, Terry Cannon, Ian Davis. 2004. *At Risk: Natural Hazards, People's Vulnerability and Disasters, 2nd ed.* New York: Routledge.

World Bank: 1980. *Poverty and Basic Needs.* September 1980. Washington DC.

World Resources Institute (WRI). 2003. "Earth Trends: Country Profiles 2003." Washington

DC. Retrieved February 8, 2007 (http://earthtrends.wri.org/select_action.php?tool=3).

Zarembo, Alan, Brook Larmer and Debra Rosenberg. 1998. "The Fury of Mitch." *Newsweek*, November 16: 32-33.