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# Climate Change and Indigenous Peoples in Latin America

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CLIMATE CHANGE AND INDIGENOUS PEOPLES IN LATIN  
AMERICA

A Thesis

Presented to

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In Partial Fulfillment

of the Requirements of the Degree

Masters of Arts

By

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## Abstract

This research focused on the detrimental effects of climate change on indigenous peoples in Latin America. Indigenous peoples throughout the region tend to live subsistence livelihoods, which tie them closely to their land and the surrounding environment. This close relationship often means that indigenous peoples acutely experience the effects of climate change and are more susceptible to its negative outcomes than other populations. Further, indigenous peoples in the region lack the mitigation and adaptation capacities to deal with damaging climatic effects.

This research was designed to view the impacts of climate change on indigenous peoples through a human rights framework, focusing on the difficulties of resource allocation and management due to climatic shifts. Methods of critique were applied to international responses to climate issues. The research clearly shows the enhanced ways in which indigenous peoples are affected by climate change and that their circumstances inform their thoughts on both the problem and possible solutions. These perspectives are significant and should be more readily considered in international climate discourse.

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CHAPTER ONE:  
GLOBAL CLIMATE CHANGE AND INDIGENOUS PEOPLES  
WITHIN AN INTERNATIONAL HUMAN RIGHTS  
FRAMEWORK

1. Climate Change and Human Rights

In today's increasingly connected and globalized society, humans on both an individual and collective level are influenced not just by their close family, friends and neighbors, but by a growing number of actors around the globe. At its best, this progressive global connectedness has produced fruitful collaborations in many realms of our existence and has created positive growth of understanding in both social and spiritual spheres. Yet, at its worst, the unprecedented growth in technology, communication and mobility have been used by governments, militaries and transnational corporations to increase their influence and consolidate power over much of the world's resources and wealth. This has resulted in a global marginalization of billions of the world's poorest citizens who are disproportionately alienated from both economic and political opportunities, and suffer from social and cultural losses.

It is in this context that the body of international human rights protections is growing and changing at a rapid rate. Since the international human rights regime began

to take form shortly after the events of World War II, the regime has adapted to an ever-changing set of global circumstances. In the last six decades the protection of human rights has continually expanded, branching out to include a greater number of issues and the regime has strived to universally protect human rights for every person. As the world has changed, so too have the concepts that define human rights protections. The Universal Declaration of Human Right (UDHR) has served to protect both civil and political rights, or first generation rights, and political, social and cultural rights, or second generation rights. Additionally, the rights of historically marginalized peoples have also been recognized. These groups include women, children, the disabled and indigenous peoples. Most importantly, in the twentieth and twenty-first centuries we have seen the expansion of what are referred to as third generation rights. These types of rights, such as collective rights, natural resources rights or environmental rights, advocate for more than just the assurance that actors will not infringe upon human rights, but that in their actions they will provide the opportunities to ensure that the cultivation of those rights is possible (Westra, 2008, 3).

In this ever-changing context, the conception of international human rights has had to confront the negative impacts of global climate change. Climate change has been well documented by both international and local institutions, especially in the last decade, where much of the uncertainty about the causes of the phenomenon and its effects have been lifted. It is now clear that the planet and its ecosystems are changing and most places across the globe are experiencing a warming effect, as well as varying changes in precipitation, storm frequency and landscape coverage. It is also clear that much of this change is anthropogenic, or caused by human beings. The assessment of human activity

since the start of the industrial revolution, mainly centered in western societies, shows that there has been a gradual warming around the globe and that this warming has been directly caused and exacerbated by a continued increase in the use of fossil fuels and the emission of greenhouse gases (GHG). As these changes have occurred, they have put in danger some of the poorest and most marginalized peoples on the planet: and they, by extension, have affected water security, food security, agricultural production, economic viability, political stability, and social cohesion. These effects have devastating consequences for the livelihood abilities of populations already living in poverty.

Environmental factors undeniably influence the protection of human rights and will be one of the most pressing issues for the human rights community in the coming years. The fact that developed countries emit the vast majority of GHG emissions while those most affected by climate change emit a fraction of the total output is an injustice and a human rights violation. To further complicate the issue of climate change, the scenario that the world finds itself in today has been produced by what can be viewed as historical human rights violations. The industrial pollution that has been perpetuated by rich and powerful countries and by the transnational industries they have helped to create, have benefited from these practices for over a century. The devastating consequences they have produced are only now becoming clear. The human rights field now faces new challenges and is confronted with new dilemmas; should human rights instruments be expanded to address historical rights violations and should those responsible for these violations be held accountable, and if so, then how? Further, the international regime has the added challenge of trying to move forward and continue to expand human rights

protections to include third generation rights while still remaining relevant at an international level among varying groups of actors who expressly violate human rights.

## 2. Climate Change and Indigenous Peoples

Global climate change, without question, will affect each and every person on our planet. Yet some populations, mainly those residing in developed countries or in larger, more affluent cities, will be fortunate enough to remain relatively removed from the costs of a warming planet. Eventually, without an effective global initiative to slow climate change, we will all face unthinkable consequences. But for populations who live in developing countries, in poor sections of cities or in rural areas, the climate crisis cannot be avoided or ignored. The altering of ecosystems has been a stark reality for decades and has only continued to escalate in the twenty-first century. The effects of climate change have been particularly acute for indigenous peoples. Across the world, these groups reside most often in rural areas, fundamentally relying on traditional means of subsistence, cultivating their own food, building their own irrigation systems and maintaining local markets. This kind of livelihood makes a healthy environment absolutely vital to their survival. Cities and large industrial centers have the advantage of being able to adapt to many, if not all, of the negative consequences of climate change. But for traditional peoples who live much closer and more connected to the land, avoiding the consequences of anthropogenic climate change is far more difficult (Westra, 2008,7).

According to a 2009 report compiled by the United Nations (UN) called *The State of the World's Indigenous Peoples*,

*Indigenous peoples continue to suffer discrimination, marginalization, extreme poverty and conflict. Some are being dispossessed of their traditional lands as their livelihoods are being undermined. Meanwhile, their belief systems, cultures, languages and ways of life continue to be threatened, sometimes even by extinction (DESA, 2009, v).*

In addition, many indigenous and traditional peoples have been historically abused by both state and private actors, being pushed to the least fertile and most fragile lands through economic, political and social exclusion and are among those at greatest risk to climatic changes (Macchi, 2008, 4). This analysis illustrates the difficult plight of indigenous peoples all over the world and it is with this background that we must consider the dire consequences that future livelihood complications could have. Climate change represents what could provide the final blow for many fragile and at risk peoples. The changes that stem from it could easily be the catalyst for the extinction to which the UN refers.

The circumstances that climate change is creating for indigenous peoples are multifaceted. First and foremost, changes in temperature, precipitation and overall weather activity have, in some instances, devastated the agricultural yields of many indigenous groups. This has not only been detrimental to their subsistence farming practices but also has destroyed important export crop markets that have allowed some populations to earn the means to survive in poverty stricken areas. Connected closely to the problems of food security, water security is also a major issue and is created by some of the same climate change trends. Indigenous communities are struggling to maintain drinking water, to irrigate their crops and to have on consistent yearly precipitation patterns that have traditionally allowed them to follow set planting and harvesting cycles.

In some areas of the world, gradual rising temperatures over the last several decades have contributed to glacial melting, which has affected valuable traditional water resources. In other areas, temperature changes have spurred on desertification that has made lands arid and unusable, pushing populations from traditional lands and forcing migration. Overall, the effects of climate change on natural resource allocation are a crucial contributing factor to the struggles of indigenous peoples and their customary ways of life.

Collectively, indigenous peoples' situations are further complicated by their inability to adapt to rapid climatic changes. Indigenous populations have historically adapted to many things and have excelled for hundreds, even thousands of years at changing their routines and lifestyles to adjust to the changing natural world. They have developed important strategies within their communities to deal with these changes, yet the magnitude of future events that will be brought on by climate change will most likely be too large of a shift over too short of a period of time, greatly limiting their capacity to adapt accordingly (Macchi, 2008, 5).

According to the Intergovernmental Panel on Climate Change (IPCC), the concept of adaptability is “the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences” (Macchi, 2008, 15). Indigenous groups tend to lack all of these things. They have a tendency to lack the ability to moderate potential damages due to a general deficiency of institutional power or technological advancement. Communities at the greatest risk also may lack opportunities through state or regional actors to further their adaptation power, and tend to lack an overall ability to cope with the consequences they experience. All of these shortcomings for indigenous

communities stem from their previously mentioned historical marginalization. Their vulnerability, as well as their lack of ability to adapt is mainly determined by a low degree of social and biophysical security deriving from poverty and the lack of entitlements to resources, power and decision-making (Macchi, 2008, 22).

### 3. International Frameworks: Protecting Human Rights, Indigenous Peoples and the Environment

In light of the tragedies that stemmed from World War II (WWII), the international community began to recognize the growing interconnected nature of the global system and pursued a path toward the universal protection of all people's rights. This was accomplished through the development of a series of declarations, treaties, covenants and conventions that would eventually lead to a modern day human rights regime. The most important human rights document that served as the foundation for the creation of the international human rights framework was the Universal Declaration of Human Rights (UDHR). This document, drafted in 1948, fostered the ideas of universal rights that were interrelated and could not be separated from one another. From this general document came the creation of both the UN International Covenant on Civil and Political Rights (ICCPR) and the UN International Covenant on Economic, Social and Cultural Rights (ICESCR). These two documents have been used throughout the last sixty years around the world to fight for the protection of rights and to aid in the expansion of the protections that the human rights regime fosters. Together, these documents have created sets of norms and values for both private actors and nation states

and they have influenced the standards of international discourse, helping to inform international law (Westra, 2008, 3).

One fundamental principle that the crafters of the UDHR attempted to perpetuate through the document was the protection of minorities and other populations at risk of discrimination and persecution. It was important, especially after the abuses towards Jews and other targeted peoples by the Nazi's during WWII, to ensure that the most vulnerable groups were not only treated with respect, but were protected from abuses by both state and individual actors. Protection for vulnerable groups has been specifically addressed in a number of successive conventions through the last several decades. These conventions include, the Convention of the Eliminations of Discrimination Against Woman (CEDAW), the Convention on Rights of the Child, and the Convention on Protections of Refugees. More recently the UN drafted and passed the Declaration on Right of Indigenous Peoples (UNDRIP), which found its roots in regional and international attempts to protect indigenous peoples around the world.

According to scholar Alicida Rita Ramos, a brief chronology of the most significant events that led to the international recognition of indigenous rights attests to the rapidity in which this recognition was attained (Warren, 2002, 252). One of the first attempts at international recognition was by the Iroquois Confederacy to the League of Nations in the 1920's. But it was not until the end of WWII and the UDHR that there was real recognition of minority rights, which would become known as the forerunner to indigenous rights (Warren, 2002, 252). For several decades indigenous peoples struggled for their rights within an international framework that often disallowed the consideration of them as "minority." In 1950, a definition of minority was put forth by the Human

Rights Sub-commission that stated the term minority applied to non-dominant citizen populations with the desire to preserve ethnic, religious or linguistic traditions but were also loyal to the state in which they lived (Warren, 2002, 253). This definition worked against many indigenous groups who wished to declare their autonomy from the nation state and hold self-determined status.

It was not until the 1970's that this same Sub-commission finally recognized the differences between indigenous peoples and other minorities. In this light an international process began to create a declaration specifically for indigenous rights. In 1989 the first and one of the most important official frameworks for the protection of indigenous rights came into force. Though there is not one concrete definition of indigenous status within international law, the International Labor Organization (ILO) Convention No. 169 Concerning Indigenous and Tribal Peoples created a definition and a set of international standards that are used regularly to defend indigenous rights in the present day (Warren, 2002, 5). More recently, the international community, mainly through mechanisms within the UN, has continued to further establish the framework for the protection of indigenous rights. In 2000 the UN created the United Nations Permanent Forum on Indigenous Issues, which has led to a greater participation of indigenous groups and citizens at the international level (DESA, 2009, 3). Further, the passing of the UNDRIP has significantly improved the international legitimacy of the efforts by indigenous peoples to protect themselves through international law. Although almost all member states have supported this document, it lacks the backing of both the United States and Canada, which significantly undermines its impact.

In considering both broad based human rights and indigenous rights, the international community has also been forced to consider protection of the environment. Previous to the emergence of climate change science and concern for the environment in the 1970's, much of international legislation involving the environment was either based on the protection of valuable market resources or for the protection of nature for beauties sake or to preserve a particular threatened species. But in the 1970's the international community began to recognize not only the detrimental effects of human activity on the planet's ecosystems, but also the consequences that this destruction was having on those populations living closely tied to the land. Many of these groups were indigenous peoples.

With concern for these types of issues, the United Nations Environmental Program (UNEP) was created in 1972 at the United Nations Conference on Human Environment (UNEP, 2010, <http://www.unep.org/>). From there, the international community has moved forward with a growing awareness of degradation and destruction of the environment as well as the effects of climate change and has generated a plethora of international laws and mechanisms to address environmental protection (DESA, 2009, 98). Yet, this growing international framework is poorly equipped to protect the environmental rights of indigenous peoples. Bases on the ideas of sovereignty, non-state actors such as indigenous groups struggle to assert their own sovereign rights while also applying international frameworks to environmental issues that affect them (DESA, 2009, 98). Though there have been difficulties, indigenous peoples have played a role in the international discourse to create environmental protections.

The crux of the argument for indigenous rights to the environment stem from their inherent rights as indigenous peoples to their own lands and territories and to access and control natural resources within those lands. These rights are protected by the aforementioned ILO Convention No. 169, as well as within the UNDRIP. Additionally, in 1992, indigenous peoples played a key role in the Rio Conference on Environment and Development, or the Earth Summit, and for the first time truly influenced the processes used by the international community in relating to the natural environment (DESA, 2009, 99). Indigenous peoples' rights and their unique connection to the environment are also recognized by the Convention on Biodiversity, the UN Framework on Climate Change, the UN Forest Principles, and the UN World Summit on Sustainable Development (DESA, 2009, 101). In sum, indigenous groups have been considered as deserving special consideration within international frameworks for protection of the environment and have increasingly participated in the creation of these protections. Yet, due to the nature of these international frameworks, their rights are still difficult to ensure. In order to alleviate these inequities the international community will need to reconsider how it views both the self-determination of indigenous groups as well as how it approaches the use of natural resources and the environment.

#### 4. Indigenous Peoples and Collective Rights Concepts

There are two key concepts that need to be understood when considering indigenous and environmental protections. Those concepts are universalism and cultural relativism. Currently, much of the human rights world is divided over the validity of these two ideals, many falling somewhere in the middle, defining themselves as having

either weak or strong universal or cultural relativist tendencies. Understanding the two positions is of major importance within the dialogue of indigenous rights because of the importance of collective rights ideas to indigenous belief systems.

Briefly, on one side of the human rights debate there are “radical universalists” who believe that an individual’s culture is completely irrelevant to the universal validity of moral rights and rules (Donnelly, 2003, 90). Therefore, one’s ethnic group or cultural heritage has no bearing on what their human rights are and that these rights are defined outside or externally from culture in a universal context. By contrast, “radical cultural relativists” believe that culture is the sole source of moral rights and rules, and that human rights are only defined by cultures specific internalities (Donnelly, 2003, 89). Between these two conflicting worldviews on human rights lie the “weak cultural relativists” (also known as a strong universalists), who consider culture to be a secondary source of rights and rules but the universality of those rights is the primary factor. And on the other side, the “strong cultural relativists” assume that culture is the primary driving force of rights and social rules and only in the most extreme cases see some very basic rights as totally universal (Donnelly, 2003, 90).

These two primary distinctions of the origin of human rights and rules are important to the understanding of indigenous rights and their collective nature. For most western cultures, human rights are inherently individualistic. And for most westerners these individualistic tendencies move them closer to the universalist side of the debate. But for many cultures around the world, especially most indigenous groups, the idea of individual rights is hard to comprehend within the societal systems that they have developed over generations. This leads many indigenous groups and their supporters to

call for at least some form of cultural relativism to be considered in the protection of human rights.

An example of the ways in which indigenous cultures are affected by the universal and individualistic beliefs is the struggle for the recognition of collective rights. Aside from the right to self-determination, which is extremely important to indigenous communities, all of the rights framed within the UDHR, the ICCPR and the ICESCR are individual in nature. For the most part, international human rights instruments refer to only the individual and can be problematic for indigenous peoples when trying to defend their rights (Westra, 2008, 39). Although it is understandable to want all human beings to have the same rights to a life of dignity, a radical universalist approach fails to consider that different cultures have emerged in very different contexts over time. The ways in which cultures view the relationship between an individual and others, as well as to nature, resources, family and community, are not always the same.

According to the UN report, *State of the Worlds Indigenous Peoples*, in 2009,

*Indigenous concepts are not confined to human beings but include all living things, underscoring an essential, unique element of the relationship of indigenous peoples to nature and their natural world that has permeated indigenous identity and is at the core of their world views and perspectives* (DESA, 2009, 190).

The concepts that many indigenous cultures have developed to create rights and rules within their societies are based on ideas of collective ownership and on the overall collectivity of their families and communities. For example, many indigenous communities view families as one functioning unit. It would be unimaginable for a child to think first of their own well being, but on the contrary they would always place the

well being of their family above themselves. In this kind of a situation a collective approach to human rights would translate into concepts of community far more effectively than individual rights ever could. Additionally, many indigenous communities have collective ownership and access to natural resources such as water. Rutgerd Boelens has done extensive work in the Andean high country with indigenous groups who have total collective ownership over the water rights within their villages. He observes, “water polices and intervention practices in the Andean highlands often neglect the cultural pluralism inherent to local and indigenous water rights practices, undermining and replacing them with externally controlled allocations, organizations and institutions” (Boelens, 2008, 127). This completely undermines the indigenous right to choose the ways in which they allocate their own resources and illustrates the lack of understanding of collective rights by state actors.

The narrow view of rights only attaching to the individual is harmful to indigenous communities, as well as wholly insufficient in the attempt to protect indigenous and collective rights. The collective dimension of indigenous cultures cannot be overlooked in human rights discussions and should be considered within the frameworks and standards which the international community wishes to set forth (DESA, 2009, 190). Especially when considering the effects of climate change and environmental degradation on indigenous peoples, the concepts that these groups apply to both nature and their relationships with one another are paramount to consider. Responsibility to both their communities and to future generations, as well as to Mother Earth, help to construct their own human rights narratives and need to be considered within the international human rights model. The starting point for most human rights instruments has been at the

individual level. Yet, Laura Westra correctly points out that simply because indigenous rights and collective ideas are *their* starting point for the discussion of rights and responsibilities to the world does not mean that it is somehow wrong, and on the contrary may actually point to the error of the individualistic starting point, especially when concerning responsibilities towards other communities and to the environment (Westra, 2008, 41).

## CHAPTER TWO: EFFECTS OF THE GLOBAL CLIMATE CRISIS ON LATIN AMERICA

### 1. An Overview of Regional Problems

In order to understand the specific effects that climate change and general warming trends are having on indigenous populations in Latin America, it is first important to have a clear perception of what climatic changes are actually occurring in the region and the general effects of these changes. Though climate issues are affecting most of the world's regions, each region has its own ailments, which in turn create specific problems for those living in these areas. Generally, there are three trends being observed in most of Latin America.

First, the region is experiencing temperature increases. Though there have been a few cooling trends reported, such as in southern Chile, most of the area is experiencing a warming in average annual temperatures. During the last decade a warming of 1 degree Celsius has been observed in Mesoamerica and South America, with the exception of Brazil where an increase of .5 degrees was seen (Magrin, 2007, 583). Though these numbers may seem insignificant, this small amount of warming has created significant climatic changes. Second, the region has been impacted by large changes in seasonal and annual precipitation. Both increases and decreases have occurred, proving troublesome

for different parts of the region. For example increases in rainfall in southeast Brazil, Paraguay, Uruguay, the Argentinean Pampas and some parts of Bolivia have impacted land use and crop yields and have increased flooding, yet a decrease in precipitation has been developing in southern Chile, southwest Argentina, southern Peru and western Central America (Magrin, 2007, 583). Third, climatic change and precipitation variations have been accompanied by extreme weather events throughout the region. These extreme weather trends, along with temperature and precipitation changes, have significantly impacted life in Latin American.

These climate change trends have, by extension, created a plethora of problems for peoples living in Latin America. According to the Report of the Second AIACC Regional Workshop for Latin America and the Caribbean,

*“Climate variability and climate change pose risks now and in the future. Resources and activities at risk include human health, food production, water resources, forests, biodiversity, rural livelihoods and coastal populations, infrastructure, fisheries and estuaries”* (AIACC, 2004, iii).

Though they will be outlined in greater detail later in this work, the following is a brief summary of some of the major effects that have been witnessed in the last several decades. Increases in temperatures in the region have had the largest effect on resources such as food and water. With temperatures rising, glaciers have been receding, fresh water resources have become scarcer and sea levels have been rising. During the last ten to twenty years the rate of sea level rise (SLR) has increased from one millimeter per year to two to three millimeters per year in southeastern South America. In the future it is predicted that adverse affects will be seen in other low-lying areas like El Salvador, Guyana and Buenos Aires (Magrin, 2007, 584). Water security has in turn affected food

security, contributing to problems with crop irrigation and agricultural production. To complicate matters, much of the region of Latin America relies on large amounts of hydroelectric power, of which, availability is being affected by reallocation of dwindling water resources and has placed power sources at risk.

Along with regional temperature increases, rain and snowfall decreases have created amplified land cover change and sped up desertification in many areas. Formerly fruitful and workable land has now become dry and arid, forcing many people to search for better land or livelihood opportunities elsewhere. The land changes that have stemmed from climate change are therefore fueling migration and growing refugee populations in Latin America. It is predicted that 50% of agricultural land in the region will likely be subjected to desertification and salinisation by the 2050's. On the other hand, increases in precipitation in other areas have also had negative effects on land use and crop yields and have heightened the risk of intense flooding (Magrin, 2007, 583). Agriculture in Latin America is particularly at risk to climate change, which is troublesome for two reasons. First, many poor and rural farmers rely on subsistence farming to feed their families and second, the agricultural sector of Latin America accounts for 10% of the gross domestic product of the region and if damaged many will suffer economic hardships (Magrin, 2007, 583).

Further, climate change and all of its accompanying trends will affect important plant and animal species that provide both sustenance and livelihood opportunities for those living in Latin America. Many plants and animals that are already endangered may be lost forever due to climatic impacts. The risks for human health and safety are also important to acknowledge. In Latin America, many diseases are water and climate-related

and can develop more aggressively due to increasingly warm and humid environments. These diseases include malaria and dengue, which can be deadly (Magrin, 2007, 583). Researchers have also shown concern for some less obvious, but equally detrimental secondary effects to populations who are being acutely affected by climate change. These effects include an increase in regional violence, a decrease in gender equality and an overall negative effect on social cohesion. In short, the effects of climate change trends will be felt heavily in the Latin American region and its manifestations have already been proven to be greatly varied and highly detrimental, especially to vulnerable indigenous groups.

## 2. Specific Sub-Regional Conditions

It is important to highlight the acute effects that are experienced by indigenous peoples due to global climate change, yet also to illustrate the ways in which climate change is altering Latin America in specific ways that differentiate it from other places in the world. By doing so, one can hope to understand the magnified plight of marginalized and poor indigenous groups in the area, appreciating both their unique struggle as Latin American indigenous groups, and the common struggles they share with other indigenous peoples around the globe. Though the region of Latin America is at times viewed as a cohesive unit by those working on climate change issues at the macro level, it is important to convey the differences in weather patterns, topography, precipitation and temperature increases that the various regions of Latin America experience. Again, with these differences in mind, one can understand the specific problems of indigenous peoples in varying sub-regions of the area, as well as how they relate to the larger picture

of indigenous struggles against climate change in Latin America. The following is a brief summary of four sub-regions of Latin America and the climatic impacts that are occurring therein. Although not an exhaustive list of the details of climate change in the region, it will serve to briefly demonstrate the variations that exist.

## **Mexico**

The very northern most state in Latin America, Mexico has over 100 million inhabitants, where more than half are affected by poverty and three-fifths live in urban areas (Chandler, 2002, 28). It is a mountainous country that is frequented by hurricanes and other tropical disturbances due to its close proximity to both Atlantic and Pacific weather patterns and the infamous El Nino currents. The region has historically been characterized by an average to above average annual precipitation, with some areas arid and others lush. Though there are desert areas, the country has historically been characterized by rural farmers who rely on rain fed agriculture to support their families, as well as by larger-scale irrigated areas, such as those in Sonora and Sinaloa states, known as the bread basket of Mexico, that supplied food to Mexico's large urban areas (Warner, 2009, 7).

In the last several decades many of these historical characterizations of Mexico's climate and topography have begun to change. Due to global changes in weather patterns brought on by anthropogenic climate change, severe weather occurrences such as tropical storms and hurricanes have increased in and around the country. This has had a large impact on crop failure, has destroyed homes and has killed thousands of Mexican citizens. Along with a heightened occurrence of storm activity, it is predicted that the

country's low-lying coastal areas, particularly around the Gulf Coast and the Caribbean, will face sea level rise that will displace coastal inhabitants and destroy ecosystems (Warner, 2009, 7).

In Mexico, as in most of Latin America, a major concern related to global warming is a rise in annual average temperature throughout the country. According to a report by the World Bank (WB) that detailed Mexico's relationship to climate change in 2009,

*By 2020 projected temperature increases in the winter (December-February) are between 0 and 2.5 C and in the summer (June – August) are in the range of 0.9 and 2.2 C3. It is very probable that by the year 2050 the climate in Mexico will become warmer by 2-4 C especially in the Central and Northern parts of the country (World Bank, 2009c, 2).*

These would be very large changes for a nation that is already struggling with poverty, food security, water security and other societal shortcomings. A rise in temperature would lead to an increase in already high soil evaporation rates, which unless combined with substantial increases in precipitation, would result in reduced runoff and soil moisture levels (Eakin, 2007, 936). Further, the heightened temperatures will further contribute to the desertification of more and more Mexican land, which will harm agriculture, force migration toward urban centers and destroy existing ecosystems.

Yet the chief concern related to climate change in Mexico is a reduction in precipitation. According to the same 2009 WB report,

*The rainfall will decrease by up to 15% in the Central part and by less than 5% in the area of the Gulf of Mexico, mainly between January and May; by 2020 projected precipitation fluctuations will be in the range of -7 to +12% (December-February) and -8 to +12% (June-August) (World Bank, 2009c, 2).*

These drops in precipitation will acutely affect the country's runoff that now supplies both irrigation and drinking water supplies, and is collected by small farmers for crop maintenance. Estimates in the decline range from 5% to 50% over the next several decades, with the northern regions of the state suffering most of all (Warner, 2009, 7).

These changes in water availability will only be exacerbated by socioeconomic situations in the country, as well as by the continued rise in temperature already occurring. Mexico, due to its unique location and topography, finds itself at major risk for climate related problems such as sea level rise, climate related weather hazards and desertification.

Additionally, it will increasingly suffer from both water and food security problems and forced migration as a result of temperature increase and precipitation decrease.

### **Central America**

Central America, situated between Mexico and the greater South American region, is made up of seven countries: Belize, Costa Rica, Nicaragua, El Salvador, Panama, Honduras and Guatemala. Similar to its Mexican neighbor, the countries that make up Central America are prone to extreme weather events, such as tropical storms and hurricanes due to their position between both the Atlantic and Pacific oceans. Yet, many areas of Central America are less mountainous than areas in Mexico and significantly less arid. Though there are several major urban centers within Central America, a large percentage of the population reside in semi-rural or completely rural sections of the region and rely on subsistence and export agriculture for livelihood assurance. Like Mexico, much of the population lives in poverty, which complicates the effects of climate change.

Generally, Central America is suffering from similar climate induced situations as in Mexico. The WB has predicted that all of the countries will face both temperature increases, as well as precipitation decreases. Though data varies depending on the time of year and area of the country, predictions of temperature increases range anywhere from .6 degrees Celsius in parts of Honduras, to 4.5 degrees Celsius in parts of Guatemala in the next several decades. Predictions for precipitation decrease are equally varied and pessimistic throughout the region (World Bank, 2009b, 1). Further, finding itself surrounded by ocean, Central America is particularly vulnerable to SLR. These rising levels acutely influence ecosystems on both the east and west sides of the region and threaten to destroy livelihoods and force migrating populations further inward to overcrowded urban centers.

Yet, for Central America, the most dangerous and devastating change that is being facilitated by climate instability is the increased occurrence of violent and deadly natural disasters, namely hurricanes and other tropical weather disturbances. Like Mexico, this region has been inundated by severe weather that has brought destruction and death to all the states. But the damage that these storms cause affect a much larger percentage of the Central American land area, making them more devastating for small countries. The effects of extreme events due to climate change, such as flooding and droughts, are the main manifestations of the extremes and approximately 85% of the disasters in Central America are related to them (Fernandez, 2006, 2). And although the overall precipitations amounts are dropping in most areas, increased intensity of rainfall during extreme weather has served to create a strange dichotomy for populations who suffer from a lack of water followed by intensified storms. Further, an increase in the number of storms

within a season has hurt communities' abilities to recover in a timely manner in order to be ready for the next weather event.

## **The Andes**

The Andean section of Latin America is one of the most diverse and varied in the entire region. Spanning from Colombia, through Ecuador and Peru, and down in to Bolivia, the area is characterized by some of the highest mountains in the world, as well as low lying coastal and tropical areas. The inhabitants of these countries are as varied as the terrain itself and have learned to live at extremely high altitudes, in intense tropical temperatures and in larger urban centers that all coexist alongside one another. Like Mexico and Central America, the countries in the Andes suffer from poverty, although less acutely than in Central America, and experience a large urban-rural divide that influences how they are affected by climate change.

Like their northern neighbors, the region is experiencing climate change through both an increase in average annual temperatures and an unpredictable fluctuation in annual precipitation. Temperatures throughout the Andes have increased, and temperature increases have been confirmed to be worse at higher elevations, compounding the issues of climate change in fragile high altitude ecosystems. By the end of the twenty-first century, some models predict that the tropical Andes will experience a warming of between 4.5 and 5 degrees, which would severely alter all life in the area (Vuille, 2008, 79). Predictions for precipitation in the next few decades reveal an increase in precipitation during the so-called "wet season" and a decrease in precipitation in the "dry season" (Vuille, 2008, 79). Similar to situations predicted for Central America, this

imbalance and unpredictable rain and snowfall will cause major problems for agricultural crops and have major livelihood impacts.

Yet, potentially the largest climate change variant that the Andean region faces is glacial melting. Unique to this region alone, the Andes are greatly threatened by the warming that is producing this glacial melt. Glacial runoff has fed aquifers, aided in irrigation and provided drinking water for many Andean communities for thousands of years. The runoff not only directly helps those living at higher elevations maintain livelihoods, but feeds many important water sources throughout the lower altitudes of the region. The effects are already being felt by the inhabitants of the area and will continue to grow with further warming. The region will see a heightened threat to water access, food security, health and subsistence livelihoods throughout. The population of the Andes still share many of the same concerns that the rest of Latin America does when it comes to temperature and precipitation changes but suffer from unique risks associated with the melting of tropical Andean glaciers.

### **Brazil and Amazonia**

Brazil is by far the largest country in all of Latin America. Covering nearly 50% of the entire landmass of South America, it shares borders of varying size with every South American country except Chile. And although nine countries share parts of the Amazon rain forest, or Amazonia, Brazil is best known for its share, constituting over 60% of the entire area. Brazil has a population of 170 million and exhibits the similar urban and rural divide seen throughout Latin America. The state has many of the largest and most populated cities in the region, while many tribal peoples, as well as campesina

farmers still live primarily off the land. Though the percentage of those living below the poverty line is lower in Brazil than in other areas of Latin America, they still have at least 10% of their citizens living without electricity and 20% living in impoverished conditions (Chandler, 2002, 4). These realities, along with its sheer size, complicate the effects of global climate change for the country.

In Brazil the three general trends that have been seen with each of the other aforementioned regions remain true. First, Brazil, like all other Latin American nations, will experience temperature increases due to global climate change. Depending on which scenario one looks to, either a more optimistic or pessimistic one, changes in annual average temperature in Brazil may increase anywhere from 1.4 degrees Celsius to 5.4 degrees Celsius (World Bank, 2009a, 1). These numbers are projected to be higher in dense, humid jungle regions, as well as in areas that have been cleared of forest cover in order to make way for cattle and agricultural operations. Secondly, Brazil will face changes to its overall precipitation. Yet this matter is one of more debate and significantly more complicated due to wide variations in the northern and southern portions of the country. In parts of eastern Amazonia, rainfall may decrease anywhere from 5-20% compared with present levels, where as in northeastern Brazil, rainfall may change anywhere from 10-15%. Conversely, in southern Brazil, as with parts of northern Argentina, it is predicted that precipitation levels will increase. This would appear to cause a positive outcome on the water supply for crop yields and basin levels, but this increase will alternatively increase flooding and crop damage, possibly having disastrous effects on both subsistence and larger export agricultural products (Marengo, 2008, 3). Third, being partially a coastal region, Brazil is also susceptible to SLR, which is feared

will harm vulnerable mangrove ecosystems (World Bank, 2009a, 1). These vast differences will undoubtedly complicate actions intended to deal with climate change for Brazilian citizens.

### 3. The Resource Problem-Climate Impacts on Food and Water Security for Indigenous Latin America

Rising temperatures, variation in precipitation and increases in severe weather are currently manifesting troubling effects on a variety of ecological and natural environments throughout Latin America and are uniquely evident in different areas. Yet these environmental factors are not the sole concern of inhabitants of the region. Global climate change is also having profound impacts on the livelihood capabilities of many Latin Americans with indigenous populations among the most severely affected. Climate change and its environmental consequences are having vitally harmful effects on two of the most fundamental resources to human survival: food and water. Availability, acquisition, and maintenance of these two resources have been the building blocks to healthy and sustainable livelihoods in indigenous Latin American communities for centuries. Through collective systems of agriculture and crop management, water collection and irrigation, and hunting and gathering, native societies have maintained themselves in many of the same ways their distant ancestors had. These traditions of food and water allocation and distribution have been passed down from generation to generation and have aided in the success of complex and self-sustaining societies. Yet with the complications that have been brought on by climate change, many indigenous

societies are being threatened with massive food and water security issues that could jeopardize precious resources, livelihoods and possibly entire cultures.

Due to all of the various climatic changes that Latin America has seen in the last several decades, indigenous peoples have experienced massive food security problems. Living closely to the land, often having little contact with the so-called modern world, these groups have struggled to maintain agricultural yields, have seen the disappearance of valuable game animals and have experienced a reduction in safe and clean fishing areas. Many have lost the ability to provide food for themselves and their families or to participate in local, regional or international agricultural markets, further complicating income and livelihood opportunities. Though indigenous groups vary in the ways they struggle with food security, the plight of the Miskito Indians in Nicaragua highlights the particular dangers that climate based food security issues have on indigenous peoples in the region.

### **Case Study: Food Security and Miskito Indians in Nicaragua**

The small Central American country of Nicaragua is among the poorest and most underdeveloped in Latin America. Astoundingly, according to the World Bank, in 2009 45.1% of the country's population was surviving on less than one dollar a day. About 41% of the population lived in rural communities, including many of the country's 85,000 indigenous peoples. Of this rural population, 68% lived in poverty and 30% in extreme poverty (World Bank, 2009, 8). In all, the economic and political situation in the country is troubling. In the country's Mosquitia region, home to mainly Miskito Indians who are the country's poorest ethnic group, the situation is at its worst. The area is

largely neglected by the Nicaraguan government and international support, lacks proper education or health care services, and has no electricity or telephone services (Oxfam, 2010, 1). There are few roads in or out of the area so supplies are often unavailable and evacuation during severe weather is extremely complicated. For the Miskito, climate change and food security are added to an unfortunately long list of other pressing concerns.

Yet Miskito Indians have not always suffered in the serious ways in which they are today. For centuries this remote group had fended off the outside world and had successfully survived through a subsistence lifestyle, growing their own food, hunting, and fishing. “People survive by growing rice and beans, and also by fishing and hunting,” explains Brunwell Perez Bell who gave an interview to Oxfam and talked about the history of the Miskito and their food supply. “People plant for their own consumption here” (Oxfam, 2010, 1). Yet now, after centuries of defending their rainforest territories from Spanish settlers, Sandinista Guerrillas, and US-backed Contra forces, the Miskito have met an enemy they are not equipped with the knowledge to fight, climate change (Kelly, 2007, 2).

“All my life the earth has told me when the rains are coming,” said Miskito elder Marciano Washington, but now he says he does not understand what is happening to the land. According the UK Guardian in 2007, Washington’s seed stock had rotted or been eaten by rats and the few rice seeds that had sprouted were only a few inches tall, yellow, and discolored (Kelly, 2007, 1). In the past decade or so this has been a common story for many Miskito who have experienced devastating environmental effects that have threatened their food security and their survival. Rainfall has been changing and

landslides and topsoil have eroded, leaving riverbanks bare and flood prone. Heavy rainfall during the traditional dry season has wreaked havoc on family crops and the majority of communities are now struggling to grow enough food to eat (Oxfam, 1, 2010). Isolated from modern farming techniques and crippled by discrimination and poverty, Miskito Indians now find themselves in a terrible predicament. Facing chronic food shortage problems, it seems that this historically strong, proud and self-reliant group may have to accept external aid, including modern agricultural and food production techniques, from the very outsiders who have driven the anthropogenic climate change that threatens their communities. If they do not, they may face a much worse fate, the extinction of their people.

### **Case Study: The Disappearance of Bolivian Glaciers and Water Security**

As discussed previously, varying precipitation and glacial melting brought on by climate change has created water security problems in the region. Water collection for both consumption and irrigation is vitally important to successful indigenous livelihoods and directly correlates to the ability of these populations to maintain food security. Though again, all indigenous communities are suffering in different ways with the problems of water security, the case study of water resource allocation and glacial melting in the highlands of Bolivia illustrates the indigenous struggle to maintain water resources in the region.

The South American state of Bolivia is home to approximately 20% of all the world's tropical glaciers, which are located in extremely high altitude locations along the

equator (Aguirre, 2010, 1). Worldwide, glaciers provide a much needed water source for drinking water, sanitation and irrigation, especially to indigenous peoples who have lived near the sources of glacial runoff for generations. For this reason, the startling trend of glacial melting caused by global temperature increases has an immense impact on the water security of indigenous peoples around the world, and specifically in Bolivia's Cordillera Real mountain range. Glaciers in this region lost 40% of their mass between 1975 and 2006. Astonishingly, the Chacataya glacier, formerly home to Bolivia's best skiing and a frequent tourist destination, completely disappeared in 2009. The Chacataya glacier formerly rested just twenty miles from the Illimani glacier, an important water source in the region that may be in similar danger. This glacier, while supplying water to both the major urban centers of El Alto and La Paz, also provides a large portion of the water supply to the small village of Khapi, which is composed of 48 families, over 90% of whom are Aymara Indian (Wagner, 2009, 3).

In the Andean region of Bolivia, more than one thousand indigenous communities depend on tropical glaciers like Illimani as their primary water source. During the rainy season, ice mass is added to glaciers while water slowly runs off the mountains and is used by the people living below (Parker, 2010, 1). The resource of water and its importance to villages like Khapi cannot be understated. Feeding local rivers and high-altitude peat bogs, Illimani and other glaciers provide water for consumption, sanitation, and irrigation (Wagner, 2009, 2). In short, the ability of indigenous peoples in villages like Khapi to nourish themselves rests primarily on the health and vitality of their glaciers. This community relies on knowledge that has been passed down from generation to generation in order to understand weather patterns and regulate water

collection and usage. Yet with rapidly changing weather occurrences these time-tested methods are failing. Javier Cortez, a farmer in Khapi, struggles to maintain crop yields and detests having to use pesticides and chemicals to keep them alive as has never before been necessary (Aguirre, 2010, 1).

But overall, the largest concern for all involved is the unreliability of water supplies. Without a consistent and reliable source of water like Illimani and the other tropical glaciers, indigenous villages in Bolivia may have to forcibly migrate and may even be faced with extinction. Unfortunately, climate scientists and glaciologists are not optimistic about the future of tropical glaciers in the Andes. According to experts, the Illimani glacier has been given a seven to ten year life expectancy if current warming trends continue (Parker, 2010, 1). Even more frightening is that some predict if global climate change is not significantly mitigated, it is doubtful that any glaciers will exist in the high Andean region in just thirty years (Aguirre, 2010, 1). For villages like Khapi this means their ability to ensure water security is in enormous jeopardy. But for many people at the foot of Illimani, the disappearance of the glaciers is about more than just water. It is about the important role in cultural and spiritual life that the glacier plays within their indigenous community, many describing the epic retreat of the ice as equivalent to the loss of a family member (Aguirre, 2010, 1).

#### 4. Amazonian Forest Cover- Most Vulnerable and Most Valuable

The Amazon rain forest is undoubtedly one of the world's most important and diverse ecosystems. Though it spans an area that includes nine different countries, well over half of this massive forest exists within Brazilian borders. The rainforest is a wealth

of both plant and animal diversity and is home to some of the most remote indigenous tribes in the world. According to present estimates by FUNAI, the federal department established to oversee Indian affairs in Brazil, 12.5% of the national territory is controlled by indigenous tribes, though they make up just 450,000 citizens, just one fourth of one percent of Brazils total population. Further, out of the estimated 580 demarcated Indian reserves set aside for indigenous peoples, 65% of them are in the Amazon, creating pockets of natural splendor and biodiversity within an otherwise ravaged Brazilian forest landscape (Hammer, 2007, 3). For decades the Brazilian Amazon has been subject to massive legal and illegal timber operations and to forest clearing for agricultural and livestock purposes. Responsible indigenous stewardship of the land has proven one of the only successful combatants to this deforestation.

Yet climate change is threatening both the indigenous peoples in this region and the ecosystem that they call home. Climate change is an obvious threat to indigenous tribes in the Amazon region. It has destroyed river basins, caused droughts in rain-soaked forest and boosted pest population, all of which have complicated life for forest inhabitants (Economist, 2008, 2). The Amazon is predicted to be one of the most affected areas on the planet. According to United Nations climate scenarios, warming in South America will be worse in the Amazonia region, with some models reaching a 6-8 degree Celsius warming trend in the next ninety years (Marengo, 2008, 1). Depending again on model optimism or pessimism, rainfall in the eastern Amazon region will reduce anywhere from 5-40% (Marengo, 2008, 1). Overall, there will be a high frequency of dry spells in eastern Amazonia and intense rainfall in western Amazonia, loss of natural

ecosystems and biodiversity, lower river levels, and more favorable conditions for the spread of dangerous forest fires (Marengo, 2008, 3).

To those indigenous peoples who rely on locally produced food and water resources these conditions will be tragic. Tribes living closely to the land in far reaching Amazon jungle areas will be acutely affected by these changes and will disproportionately feel the effects of climate change in comparison to their contribution toward the emissions fueling it. Yet, conversely it appears that these changes may in fact present opportunities for indigenous peoples that have not been available in the past. Due to the great importance of forests and healthy forest cover to countering emissions and climate change, international groups working on climate issues are seeking successful forest stewardship models. These groups are more readily looking to indigenous tribes, especially within Amazonia, for their input on protecting forests and maintaining them sustainably. So although the Amazon and the indigenous peoples who inhabit it are among the most vulnerable to climate change they might also provide some of the most valuable knowledge to help move toward viable solutions. The following case study of the Surui tribe in Brazil illustrates indigenous practices blended with modern technology in an attempt to combat climate change, end deforestation and protect the Surui people.

### **Case Study: Forest Protection and the Surui Tribe of Brazil**

The Brazilian Amazon contains some of the most remote and diverse indigenous tribal groups in the world. Some isolated groups are still at the present time uncontacted by outsiders, while others maintain only minimal contact with loggers, ranchers and in some cases, members of the Brazilian government. Yet there are other tribes that have

been in contact with outsiders for decades and who are attempting to increase a direct dialogue with the globalized world for practical and beneficial purposes. Because groups in this area are acutely affected by global climate change and heavily infringed upon by illegal logging and other irresponsible forestry practices, some indigenous leaders are seeking to create fruitful relationships with outsiders to help protect their land. Tribes have sought assistance from both regional and global intergovernmental organizations, non-governmental organizations (NGO's) and even transnational corporations like Google, to ensure that these dangers are addressed. Tribal leaders are hopeful that seeking support from outsiders will help to ensure survival of their peoples and to safeguard their land, resources and cultural identities.

Deep in the Amazon rainforest, there are 248,000 hectares of virtually pristine land that stand in stark contrast to the dry, dusty and completely deforested landscape that surrounds it. The Surui tribe inhabits this large area of forest, lead by their chief Almir Narayamoga Surui (Zwick, 2009, 2). Contact was made with this tribe in 1969, at which point disease brought by outsiders wiped out most of the tribe's population and land speculators took most of their territory. Later, the government of Brazil eventually enacted laws that protected this and other indigenous land but, by this time, nearly all economic opportunities had been lost to the Surui and they themselves were reduced to deforesting their own land to survive (Zwick, 2009, 2). For the last fifteen years things have begun to change for the Surui people with the help and dedication of their leader, Almir. The only member of his tribe to attend university and the first to visit the west, Almir is attempting to institute a fifty-year plan to save the rainforest and his people, receiving powerful support from allies in Brazil and abroad (Hammer, 2007, 1). Single

handedly Almir has brought his tribe back from near extinction and has created ties to the outside world to ensure for them a viable future.

Almir's fifty-year plan is a development plan for his tribe that includes efforts to create a viable economy, provide jobs and education and protect their land from logging and other environmental damages. The campaign to improve the situation of the tribe has included creating a mapmaking project in which the tribe's history and traditions, as well as the current landscape, will be recorded. It is hoped this will provide training, jobs and benefits for the surrounding Surui people (Hammer, 2007, 2). Almir has also sought to take advantage of the United Nations Reduce Greenhouse Gas Emissions from Deforestation and Forest Degradation (REDD) plan to earn credits for acting as guardians of the rainforest. With the money that would be made through schemes like REDD, Almir hopes to be able to finance the activities of his fifty-year plan (Zwick, 2009, 1). Additionally, and possibly most ambitiously, Almir has managed to attain a deal with global internet giant Google to use their Google Earth technology to track illegal logging and mark the habitats of precious plant and bird species (Economist, 2008, 3).

Undoubtedly, this will be an uphill battle for Almir and his people. First, they will have to keep peace and consensus among themselves in order for the plan to be successful. Thus far, Almir has persuaded fourteen of eighteen Surui chiefs to declare a moratorium on logging within the reserve. Even though the removal of timber from the areas is illegal, some chiefs will allow it, or even support it, as it provides jobs for some 4,000 inhabitants and is a reliable source of steady income (Hammer, 2007, 2). Further, some critics of the UN's REDD scheme fear that indigenous tribes like the Surui will lose out on benefits from the program because the schemes are based on rewarding reduction

of deforestation from previous levels. Vasco van Roosmalen, director of the Amazon Conservation Team-Brazil states, “REDD should enhance recognition that indigenous people have maintained the state of their forests, not penalize them for this stewardship” (Butler, 2009, 2). Many fear that the REDD program would not provide the carbon payments needed for Almir’s plan to be realized.

One thing seems to be certain, indigenous peoples are one of the world’s best stewards for saving and maintaining healthy forest spaces that will contribute the curbing of global climate change. “If anything offers hope for the survival both of the world’s remaining rainforest and its inhabitants, it may be the rich world’s feeling that forest-dwellers are the most effective stewards both of carbon and biodiversity” (Economist, 2008, 2). Research has recently shown that indigenous reserves are particularly effective at slowing forest clearing in highly deforested areas and that the incidence of dangerous fires in reserve areas, magnified by warming temperatures, are half that of those in non-protected areas (Butler, 2009, 2).

Though the health and vitality of many forested areas in Latin American and around the globe seem to be directly linked to the stewardship of tribes like the Surui, the removal of indigenous peoples from their traditional lands, forested and otherwise, is widespread. Perhaps surprisingly, a large portion of this forced removal is being done under the constructs of conservation, where well known conservation group like Conservation International (CI), The Nature Conservancy (TNC), the World Wildlife Fund (WWF), and the Wildlife Conservation Society (WCS) support policies that protect massive amounts of land area from human use, including that of indigenous peoples.

About half the land currently selected for protection is occupied or regularly used by indigenous peoples and in the Americas the figure is over 80% (Dowie, 2010, 30).

This phenomenon has created what researchers call the “conservation refugee,” who are removed from their homelands involuntarily, either by force or through a variety of less coercive measures (Dowie, 2010, 30). These removals are not just troubling human rights violations but are also problematic for the vitality of the areas they are supposedly protecting. Indigenous groups are often an integral part of the ecosystems in which they reside, working in balance with other species to control populations, pollinate diverse seed and maintain corridors between delicate ecosystems (Dowie, 2005, 35). By taking the human component out of the natural environment, groups of well meaning people are violating the rights of indigenous peoples, while also disturbing the balance of the ecosystems they aspire to protect. Further, they are removing valuable conservationists and eliminating human action that could aid in the preservation of forests and other beneficial environments whose existence aid in the fight against global climate change. The collaboration among international groups and indigenous peoples like the Surui has the potential to impact deforestation, global carbon emissions and climate change while also aiding conservation agendas. If fostered, these relationships could assist in finding respectful and effective ways of protecting the environment while also protecting the livelihoods of those living within it.

## 5. Increased Migration, Environmental Refugees and Climate Change

As the effects of anthropogenic climate change manifest themselves in the forms of temperature increases, precipitation decreases and soil degradation, Latin America has

seen an increase in migration and an escalation in environmental refugees. These populations often include the poorest and most oppressed citizens, many of whom are indigenous. Overall, an increase of movement has been seen in the region when people are forced to move from their homes in search of improved livelihoods. At its worst, this movement produces environmental refugees. Although not technically given refugee status under the UN, the environmental refugee has been increasingly recognized on the international level and has gained considerable attention in the last decade. These are people who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems and are forced to flee their country (Myers, 2002, 609). Those peoples who are not fleeing their native country are often internally displaced for temporary periods or migrate permanently within their home country. The frequently quoted figure of 200 million environmental displaced peoples by 2050 testifies to the looming importance of this phenomenon (Depez, 2010, 2).

The Fourth Intergovernmental Panel on Climate Change (IPCC) Report confirmed that human migration would be one of the most important consequences of anthropogenic climate change (Depez, 2010, 1). Forced movement places families and communities at risk both economically and socially, creating undue strain on groups that are already marginalized and disenfranchised. Warming temperatures, decreased precipitation, SLR and increased storm frequency have destroyed subsistence crops and devastated once prosperous land, deeply harming small farmers. It is under these conditions that many people, including large numbers of indigenous peoples, have been

forced to migrate from the region of Chiapas, Mexico. The following case study will detail this migration and the current situation there.

### **Case Study: Increased Migration in Chiapas, Mexico**

The region of Chiapas is one of the poorest states in all of Mexico. It has the lowest GDP per capita and has traditionally struggled socio-economically. Though the region has been marred by poverty and internal political strife, it has not historically been known for its out migration like some areas of the country (Alscher, 2009, 17). Out-migration has been a relatively new occurrence in the last decade and can, in part, be connected to climate change factors. Chiapas is particularly affected by climate change and its outcomes due to its location. It is directly in the path of many tropical storms and environmental disturbances that put it at risk for severe and repetitive storm damage. The state also shares a border with the Pacific Ocean, which has made it vulnerable to sea level rising. Additionally, Chiapas is home to many indigenous subsistence farmers who have suffered from lack of rain and desertification of their land, forcing them to migrate.

Mexican researchers generally cite the agricultural crisis since the 1980's and the violent conflicts after the Zapatista rebellion in the 1990's as the main factors for the growing migration outflow (Alscher, 2009, 19). Yet it is important to recognize that much of the migration in the last several years has been complicated by global climate change. The area has suffered from rising out-migration as hurricanes have become stronger and more recurrent, in direct correlation to varying weather patterns created by climatic changes (Deprez, 2010, 1). Mexico's National Meteorological Service has said that drought periods are getting longer and more extreme in several regions of the

country. The state of Chiapas has the added problem of increasingly torrential rainfalls that create flooding and destroy homes and crops (Alscher, 2009, 8). These changes have all been linked to a changing climate. As a result, the ability of many indigenous families to provide sustainable livelihoods for themselves has been hampered, increasing migration from the region to more productive or secure areas.

## 6. Overlooked Secondary Effects of Climate Change

The effects of climate change within a Latin American context are primarily tangible in nature. Changes in temperature, reduction in precipitation, strength and frequency of storm patterns and rising sea levels, are all changes that can be seen and felt in people's everyday experiences. Specifically for indigenous Latin Americans, climate changes effects on food security, water availability, and land use are changes that can also be easily perceived. Yet recently, less tangible changes have been occurring at a societal and social level that are not as easily articulated by those experiencing them or by researchers trying to understand them. Climate change and its residual effects are having an impact on regional conflicts, gender equality, and overall social cohesion in both a broader Latin American context and more specifically for indigenous groups.

In 2007 the German Advisory Council on Global Change published a report called "World in Transition: Global Climate Change as a Security Risk." It detailed the general risks of climate change on international, regional, and local security and highlighted the importance of addressing climate change in order to avoid future conflict risks. Experts fear that climatic change and instability will lead to amplified violence and conflict, especially in impoverished and marginalized areas. As discussed above, many

indigenous groups in Latin America are, in fact, living marginalized lives within extreme poverty. The report defines what are considered “conflict constellations,” which are typical causal linkages at the interface of environment and society, whose dynamic can lead to social destabilization and, in the end, to violence (Shubert, 2007, 2). There are four so-called conflict constellations that are highlighted by the report: climate-induced degradation of freshwater resources, climate-induced decline of food production and food production systems, climate-induced increase in storm and flood disasters, and environmentally-induced migration (Shubert, 2007. 3-4).

Indigenous peoples throughout the Latin America suffer from varying combinations of these four conflict constellations. In the cases of both Central America and Mexico, they suffer acutely from all four. Tensions that have already manifested themselves in struggling and oppressed indigenous areas have the potential to become worse with the exacerbation of the negative impacts of climate change. In addition, it is possible that further conflict both regionally and internationally could stem from the anger of countries and peoples heavily affected by climate change towards countries and peoples that are viewed as not doing enough to cut their own emissions (IRIN, 2007, 1). The chances of conflict and violence within communities over allocation of resources, as well as increased strife between international and local actors could both be amplified as climate change continues.

In addition to the risk of insecurity and violence, climate change serves to further complicate the livelihoods of women around the world and exacerbates already existing inequalities and rights abuses. Indigenous women in Latin America have historically struggled for their rights and for equality with their male counterparts. Although there are

indigenous women who, through systems of collective ownership, are able to have a significant role in both domestic and economic affairs, many face discrimination, sexual violence and an unfair work burden. They also tend to be responsible for the bulk of parenting and child rearing duties. Therefore, indigenous women are often burdened with both their marginalized status as indigenous peoples, as well as their oppressed status as women. On top of a multitude of gender related inequities, women throughout the world are particularly affected by climate change as a result of their disproportionate involvement in reproduction work, their insecure property rights, limited access to resources, and reduced mobility (Macchi, 2008, 5). This is especially true of indigenous women. When climatic changes complicate an already inequitable livelihood, a woman's lack of access to resources, mobility and property hampers her ability to adapt to climate change in the ways that her male counterpart may be able to.

Women are particularly susceptible to the impacts of natural disasters. This susceptibility provides an example of the complications climate change poses to the livelihoods of women. When hurricanes, floods or other weather phenomenon occur more frequently due to climatic changes, the domestic duties of a woman are made exponentially more difficult. Along with these challenges, natural disasters can further hamper her ability to mobilize and can place more barriers on her capacity to acquire food and water resources for herself and her children. In an unequal world, the obstacles that women face in securing their rights are amplified by complications from the acceleration of climate change.

Lastly, climate change can harm social cohesion within indigenous groups in Latin America. Indigenous peoples are profoundly reliant on social ties and networks to

define themselves within their communities. They often maintain social and economic relationships among varied groups within a small region and in many places in Latin America still utilize systems of food and labor sharing that include exchange, reciprocity, barter and local markets. They often remain unaffiliated with larger national, regional, or global systems (Macchi, 2008, 17). As a result of climate change and its impacts on their communities, indigenous peoples could become increasingly dependent on outside sources for resource allocation and more reliant on aid provided by states, NGO's, or international organizations. This would be especially true in times of crisis that they may not have the capacity to adapt to (Macchi, 2008, 17). Indigenous groups have often resided in the same villages or areas for hundreds, if not thousands of years, and have developed intricate and meaningful ways of tying subsistence activities to their social networks that are used to define the very nature of their communal identities.

The allocation, distribution and use of water in Andean communities illustrate the ties between necessary subsistence activities, that of securing and providing water for a community, and social networks. Water rights in Andean indigenous communities are typically granted to families, all of whom belong to a water collective. This is vastly different than many water ownership processes in most of Latin America, which are based on individual (mainly male) ownership models (Boelens, 2008, 130). The participating families build important elements of their identity by forming part of a community and its collective irrigation system. Moreover, the rights of individuals are directly derived from this collective rights system and their membership responsibilities (Boelens, 2008, 130). Therefore the connection between social identity is directly connected to the activity of water distribution, as well as other economic and political

activities. If climate change continues to escalate, the pressures that already exist for indigenous communities will continue to worsen, possibly forcing them to abandon systems that have defined individuals, families and communities for generations. The loss of communal systems like that of water irrigation in the Andes would be detrimental to social networks, harming the cohesive nature of indigenous societies.

# CHAPTER THREE:

## INTERNATIONAL GOVERNANCE AND NATION STATE RESPONSES

### 1. The COP 15 and the Copenhagen Accord

As the realities of climate change have become apparent in the last several decades, the international community, as discussed briefly in Chapter 1, has begun to take steps to address the emerging issues. It has become clear that in order to deal with climate change the UN, in cooperation with nation states, must take far more aggressive measures than simply protecting the natural environment as it had done in the past. Now international actors are tasked with finding ways to curb the sources of climate change, mitigating the effects on the world's population and helping many adapt to the changes that are already taking place around the globe. The methods used to accomplish such progressive steps need to be much more elaborate and far more specific than any created in the past. The UNEP had dealt with many environmental issues in the past but met new challenges when the problems of global climate change came into focus. Understanding that climate change needed to be addressed specifically, the UN sought to create an internal body that would deal solely with climate change issues. Hence, the Intergovernmental Committee on Climate Change (IPCC) was founded in 1988 by the

UNEP and served as recognition that climate change was indeed real and needed the attention of the international community (UNEP, 2010, <http://www.unep.org/>).

Following the creation of the IPCC, the United Nations Framework Convention on Climate Change (UNFCCC) was created in 1992 so that real legislative steps could be taken to combat climate change. Its inception was the first major and significant result of the Conference of Rio de Janeiro, held between June 3 and 14 of that year. The UNFCCC proceeded to move beyond simply researching and understanding climate change. Its purpose was to actively attempt to alleviate climate change by stabilizing greenhouse gas emissions in the atmosphere. With nearly universal ratification by 192 countries, the UNFCCC came into force on March 21, 1994 (Sampaio, 2009, 2). One of the most important contributions of the UNFCCC on climate change discourse was its creation of the annual meeting of the Conferences of Parties (COP). These COP gatherings have been held every year since 1995 and aim to facilitate cooperation among UNFCCC member countries.

It was hoped that this cooperation would further the UNFCCC's mission of mitigating human interference in the processes of climate change (Sampaio, 2009, 5). However, the results of the early conferences were not legally binding, which meant that the participating countries were urged but not required to curb their greenhouse gas emissions. The lack of any form of legally binding agreement that would force compliance to strict emissions reductions was a glaring weakness in the system. Therefore, nations agreed that real and progressive action needed to be taken and goals were set to create a binding piece of legislation at the COP 3, to be held in 1997. COP 3, arguably the most well known of any of the conferences, was held in Kyoto, Japan and

saw the creation of the Kyoto Protocol. The protocol was tied to the UNFCCC and created supposedly binding emission reduction targets for thirty-seven industrialized nations and the European Union in hopes of substantially curbing greenhouse gases and mitigating climate change (UNFCCC, 2010, <http://unfccc.int/2860.php>).

Since 1997, a number of problems have emerged over the Kyoto Protocol. First, though the agreement was said to be binding, no real measures were ever put into place to hold countries to their targets. Since the late 1990's many of the committed countries have failed to even come close to their reduction goals, reducing both the normative force and concrete value of the agreement. Secondly, the United States failed to ever accept the obligations that were set forth by the protocol, which greatly hampered its efficacy. Thirdly, the goals set within Kyoto are set to expire in 2012, with no other binding resolution to take its place. Therefore, it was the major goal of the COP 15, held in Copenhagen in 2009, to create a binding emissions agreement that would take the place of Kyoto in 2012. Unfortunately, this did not come to fruition and the only thing that the COP 15 was able to produce was the Copenhagen Accord. The document, created by the United States, China, India, South Africa, and Brazil, falls short of the expectations many had for a document that would take the place of the Kyoto Protocol. In the end, the UNFCCC agreed only to "take notice" of the accord, leaving it with very little normative, substance or legislative power.

The Copenhagen Accord received criticism for a number of reasons. First, it was negotiated by only a handful of countries, just a fraction of the 192 conference party member states. According to Martin Khor of the South Centre, who is a detractor of the accord, "the hiving off [of] some countries into a separate track with a separate document

is not the right way to conduct global climate negotiations. The way forward is to return to the multilateral forum, where the complex issues have to be sorted out” (Khor, 2010, 4). Second, not only did the document fail to replace the emissions standards of Kyoto, it actually moved backwards from the 1997 goals. Barack Obama has tried to commit cuts for the US in the range of 17% below 2005 levels by 2020. This may sound progressive but would only account for a 4% cut below 1990 levels, which is 1% less than would have been binding through Kyoto (Doyle, 2010, 3). Additionally, the International Energy Agency has calculated that all the action plans that countries have submitted through the Copenhagen Accord thus far will not stabilize long-term concentration levels of GHG’s at a level to hold temperature changes to the goal of a 2 degree Celsius rise, which was the expectation set by the COP 15. Adversely, the pledges would create levels of a 3-degree Celsius rise, much higher than many countries would like (Chazan, 2010, 1).

Thirdly, the accord has been criticized by indigenous communities for being void of any forest protection or protection of indigenous peoples who are facing the worst effects of higher temperature changes and other climatic events. They have been left vulnerable in the final text from the COP 15 (McDonald, 2009, 1). In all, the COP 15 is seen largely as a failure on both the grassroots and international level. Not only did it fail to create any binding resolution, as hoped for, but the document it produced actually took steps backward from the goals of the COP 3. As the consequences of climate change are becoming more and more apparent and the speed at which the devastation from them seems to be increasing, the international community has made little progress toward curbing emissions or finding consensus on the most effective ways to do so. Further, the

divisions between developed and developing countries is widening and the COP seems to be unable to initiate the cooperation that is needed between the world's wealthiest nations and the world's poorest and most vulnerable.

## 2. Adaptation, Mitigation, Capacity Building and Technology Transfers

As an international body, the UN, through the UNEP, the UNFCCC and other sub-groups, has put forth a number of solutions to deal with the effects of climate change. Aside from attempting to curb emissions coming out of the industrialized world, the UN has also had to address the effects that the changes have had and how to create safeguards for populations being adversely affected. Through an evaluation of the vulnerability of specific populations, the UN has created several strategies to aid these populations. According to Omar D. Cardona, vulnerability is defined as an internal risk factor of the subject or system and represents the physical, economic, political or social susceptibility of a community to damage from anthropogenic changes (Cardona, 2003, 1.) To tackle this vulnerability, the UN and the international community have offered two solutions, adaptation and mitigation.

Concepts of adaptation can be defined either by anticipative or reactive measures to alleviate the adverse impacts of climate change, or as actions taken to help communities and ecosystems cope with the change in condition or adjustments (Sampaio, 2009, 24). Adaptation efforts are headed by the Adaptation Fund, a creation of the UNFCCC as a source for funding through market-based methods (Czarnecki, 2009, 79). The overall purpose of the fund is to finance concrete adaptation projects and programs and to provide direct access to the funds for populations in need (Czarnecki, 2009, 81). Some

examples of specific adaptation strategies include crop diversification to minimize harvest risk, changes in living areas, changes in hunting and gathering periods and diversification of food consumption and storage (Macchi, 2008, 41). Ideally, adaptation is locally driven and guided by stakeholder participation that is fundamental to the successful reduction of vulnerability (Eakin, 2007, 938). Yet, what begins at the local level must be supported by additional financial resources and technology that will allow populations without the means to deal with climate change to do so (DESA, 2009, 114).

Along with the promotion of adaptation for vulnerable populations, the UN supports the strategy of mitigation. The Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change outlines mitigation and its strategies at exhaustive length. For the purpose of this thesis a much-shortened version will be offered in order to explain the basic concept behind it. The concept of mitigation seeks to do exactly what it says: to mitigate or moderate the GHG's that are causing the largest proportion of global climate change. The hope of the UN, and specifically the IPCC, is that mitigation will curb the overall temperature rise and allow for easier adaptation. Current mitigation efforts include a wide range of tactics that, like adaptation, are largely market oriented. These initiatives include bio-fuel plantations, hydropower dams, geothermal plants and a series of projects to deal with emissions reductions in general. These would hopefully reduce emissions from deforestation and forest degradation, in particular through REDD, which will be discussed in detail later in this work (DESA, 2009, 116).

Through adaptation and mitigation strategies, the UN envisions ways in which all populations, but especially marginalized and threatened groups, can deal with the current and future effects of climate change. Yet, looking at the forms of adaptation and mitigation being offered, it is easy to see that these strategies can be costly and difficult, especially for poor majorities in many developing nations. Therefore, the UN also supports capacity building and technology transfers in order to support adaptation and mitigation. According to the ICPP, the ability of a system to adjust to climate changes, which include climate variability and extremes, to moderate potential damages, to take advantage of opportunities, or to cope with potential consequences make up a country's "active capacity." Many countries around the world lack adaptive capacity and therefore it is hoped that capacity building will alleviate difficulties. According to the UNEP, capacity building consists of strengthening the national institutions responsible for environmental issues as well as for the implementation of multilateral agreements that will promote the achievement of the objective of sustainable environmental protections. Further, capacity building should support local and a national dissemination of the best practices and experiences to deal with environmental change (UNDP, 2004, 2). In effect, these policies wish to pass scientific knowledge from the developed to the developing world in order to enable adaptation and mitigation.

In addition to a push for greater capacity building within nation states, the UN has also made moves to improve the flow of useful technologies to groups who will benefit from them. Called technology transfers, Article 4.5 of the UNFCCC states that developed countries shall "take all practical steps to promote, facilitate, and finance, as appropriate, the transfer of or access to, environmentally sound technologies and know-how to other

Parties, particularly developing country Parties to enable them to implement the provisions of the convention” (Kulkarni, 2003, 257). Further, the IPCC, which serves as advisor to the UNFCCC, has defined technology transfers as “a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector enterprises, financial institutions, NGO’s, and research/education institutions” (Kulkarni, 2003, 257). Similar to capacity building, the UN hopes to provide tools for developing, underprepared populations so that they may deal with climate change and adapt to new challenges.

### 3. Carbon Markets, REDD and Migration Control

Clearly, in attempting to control climate change and alleviate its symptoms, the international community, spearheaded by the UN, has pushed for market-based solutions to a growing global problem. Adaptation and mitigation, along with capacity building and technology transfers, seek to answer the dilemmas of climate change through many of the same apparatuses that are customary in the modern globalized world. These methods rely on profit based markets and technological advances and are akin to neo-liberal policies similar to those put forth by the World Bank (WB) and the International Monetary Fund (IMF) during the 1980’s. These trends are further shown in the prevalence of carbon markets, or cap and trade systems, as well as the “Reduce Greenhouse Gas Emissions from Deforestation and Forest Degradation” scheme, or REDD. Both methods, which are supported by the UN and many industrialized nations, commodify the natural environment in order to create both revenue and incentive for states and other groups to

conserve and protect the environment. It is, in turn, hoped that these monetary incentives will foster the goals of conservation and protection, which will then mitigate the effects of climate change.

Carbon markets have emerged with strong backing from many on the international stage in the last decade. Simply, they are a mechanism that allows for the buying, selling and trading of carbon output credits, utilizing a method of capping emissions at certain set levels. This can be done either voluntarily or mandatorily. First, a voluntary carbon market involves the emitter of carbon volunteering to reduce their own carbon emissions by buying allowances from other countries or large corporations, who then will use the money towards diminishing the carbon concentrations in the atmosphere. Second, in mandatory carbon markets the emitter has a carbon emission limit imposed onto them. Therefore, they must find ways to conduct business, whether at the state or corporate level, within these limitations. This creates a market in which lower emitting entities can save their allowances and then sell them to those who need them, hence the term cap and trade (Sampaio, 2009, 24).

Shortly after the Copenhagen meeting of the COP, the European Union came out strongly in favor of strong carbon markets as a primary way to end climate change. In a report by the European Commission, the body called for the maintenance of a well-functioning carbon market that would be “essential for driving low-carbon investments and achieving global mitigation objectives in a cost effective manner” (Commission to the European Parliament, 2010, 11). It is believed that carbon markets will generate important monetary flow to developing countries and will aid in fueling adaptation and capacity building. Further, the commission addressed the upcoming COP 16 that will be

held in Cancun, Mexico and the importance that should be placed on pushing for better carbon markets during the gathering. The commission stated that “a major goal for Cancun should be to anchor the improved and new carbon market mechanisms as means to reach ambitious mitigation objectives and generate financial flows to developing countries. In addition it should provide a basis for the creation of new sector-wide mechanisms” (European Commission, 2010, 12).

The international community has sought to mitigate climate change through the promotion of overall emissions reductions and GHG control through carbon markets. By extension, the UN and many nation states have begun to promote forest stewardship as one of the main ways to help reduce the amount of carbon and other dangerous and harmful GHG’s into the atmosphere. Creating what are called carbon sinks, large forest and jungle areas like the Amazon provide a large amount of filtration, purifying the atmosphere that surrounds them of harmful gases and releasing oxygen. This process helps to reduce the amount of GHG’s and, by extension, aids to combat global climate change. By supporting programs that both save existing forest areas, as well as contribute to the replanting of trees, the international community seeks to reward stewards through monetary and carbon offset compensation in hopes that those rewards will perpetuate a cycle of conservation, addressing climate change while creating market-based solutions for developing actors.

REDD is a relatively new solution that is being promoted by the international community to address climate change. It was fundamentally developed in 2005 at the COP 11 in Montreal (Parker, 2010, 12). Subsequently highlighted at the COP 15 in Copenhagen, REDD seems to be one place in which the “global north” and the “global

south,” or developed and developing countries can find ample common ground. The “global north” is attracted to REDD because of the potential for easy and cheap emissions reductions and low cost offsets and the “global south” is attracted to REDD for the lure of finance and investment opportunities (Alden Wily, 2010, 13). According to The Little REDD handbook, an informational document produced by The Global Canopy Program:

*“The basic idea behind Reducing Emissions from Deforestation and Degradation (REDD) is simple: Countries that are willing and able to reduce emissions from deforestation should be financially compensated for doing so. Previous approaches to curb global deforestation have so far been unsuccessful, however, and REDD provides a new framework to allow deforesting countries to break this historic trend”* (Parker, 2010, 12)

Those who believe strongly in the force that REDD could have on climate change are pushing for the next climate agreement to have incentives that remunerate forest nations for the valuable climate services that they provide to the world (Parker, 2010, 4).

Lastly, the international community has been faced with the growing trend of cross border migration that has escalated in the last decade due to climate-induced hardships. Although economic and political factors are currently the dominant drivers of displacement and migration worldwide, climate change is beginning to have a detectable effect and is complicating current scenarios (Warner, 2009, IV). As discussed earlier, changes in temperature and precipitation patterns, glacial melting and sea level rise all greatly affect farming operations and subsistence livelihoods all over the world. As climate change increases so does the frequency and intensity of those situations, as well as natural disasters, which create a rise in temporarily and permanently displaced peoples. This will continue to be especially true in countries that are unable or fail to invest in disaster risk reduction (Warner, 2009, IV). In response, the international community has

sought to control migration by both facilitating movement from areas that are at risk to such changes and prohibiting movement to areas that are seen as unstable. In some cases, governments are undertaking large-scale action to move populations, thereby managing the migration process (Warner, 2009, 21). Also, the international community has taken into account that migration itself is a product of climate change and by preventing these changes through implementation of adaptation measures, migration will become less of an issue. Overall, migration due to environmental change is a problem that the international community is just beginning to recognize. The international community has a long way to go in establishing mechanisms to deal with it in the most effective manner.

## CHAPTER FOUR: INTERNATIONAL GRASSROOTS RESPONSES

### 1. NGO's, Grassroots Organization and Locally Based Initiatives

As the planet rapidly changes and the world's population struggles with the ever-growing consequences of climate change on both the human population and the rest of the natural environment, both national and international perspectives on the crisis are framed by the actions carried out by the UN and by nation states. Although this level of response is important and could potentially hold the key to the most expedient and effective solutions to climate change, it is a system plagued by inefficiencies at every turn. From a lack of commitment and funding to issues of transparency and accountability, the international apparatuses that have been built up by the UN in the last two decades are inadequate and have failed to deliver permanent solutions to those most in need. In reaction to the inability of bodies like the UNFCCC to provide a reliable framework for aid, as well as to the unwillingness of most developed nations to contribute adequate funding for many of the proposed international solutions, NGO's, grassroots organizations and locally based initiatives have gained momentum in the last several years.

NGO's based in developed countries, as well as an assorted group of locally based actors in developing countries, have begun to address both the effects of climate change

on a small scale, as well as to consider how to influence policy initiatives and climate solutions at the international level. These groups often include indigenous actors and are frequently influenced by indigenous concepts of subsistence livelihoods, collective ownership and communal ideals. Indigenous peoples throughout the world have recognized that the rapid pace of human-induced climate change calls for decisive action not only at the international level but also at the national and local levels in order to fill the implementation gap and fully respect indigenous peoples' environmental rights (DESA, 2009, 107). The list of NGO's working toward locally based solutions to climate change, while attempting to create dialogue at the international level, is impressive. Large and well known NGO's like Oxfam International and CARE, which traditionally work on any number of pressing issues, from human rights abuses to famine relief, have actively taken on the issues that surround climate change. Recognizing that many of the worst changes are afflicting communities that they are already working within, these NGO's have contributed to the academic work on climate change through briefing papers and reports and have campaigned on the ground, sponsoring initiatives specific to climate change in areas of need.

In addition to larger organization based mainly in developed countries, there has been a growth of grassroots and local initiatives in developing countries and in areas that are being acutely affected by climate change instability. In Latin America, as well as all over the world, small and locally based organizations made up of campesina farmers, women's collectives, indigenous communities, and other highly marginalized and disenfranchised peoples have formed to address climate change and its effects. These groups vary in goal orientation, some aiming to address local difficulties with resource

allocation, others wishing to push for further involvement by their national government on climate change issues, and others attempting to bridge the large gap between local problems and international solutions by creating a forum for local voices in international discourse. The presence of many of these grassroots groups was felt heavily at the COP 15 in Copenhagen at the end of 2009. Activists and grassroots campaigners from all over the world, who represented many people struggling with climate change issues, flooded to the COP to voice their concerns over the growing effects of climate change, as well as to present alternatives to market-based solutions and the international agenda as it currently stands.

But possibly the most powerful and effective way for these groups to make their concerns and their ideas for change heard at the nation state and international level is to form coalitions and to work together. The pairing of a large NGO or other organization from the developed world with several smaller and less influential groups can often times gain more attention than when organizations attempt to work alone. The credibility and experience of an organization from the developed world, paired with the local knowledge, experience and passion of smaller grassroots groups can form a union that both regional and international powers feel more compelled to pay attention to. Recently, at the end of 2008, several groups of varying size and influence came together to voice their opposition to the definition of “forests” under the UNFCCC and REDD climate policies. At the COP 14 in Poznan, Poland, the groups Global Forest Coalition, The Wilderness Society, World Rainforest Movement, Global Justice Ecology Project, Via Campesina, The International Youth Delegation and the STOP GE Trees Campaign united and were able to garner attention that separately would have been impossible to

achieve. Together they made a strong statement that many varied groups from all walks of life and of all livelihood backgrounds care enough about a certain climate change issue to come together and address it (Global Justice Equality Project, 2008, 1). It is in these seemingly small but extraordinarily meaningful ways that a grassroots movement, based both locally and internationally, is developing throughout the world and could possibly begin to inform and influence climate change policies at the national and international levels. It remains to be seen whether NGO's and grassroots organizations will harness this potential and if the international community will see the value in listening to and attempting to follow the insights offered.

## 2. Key Concepts: Climate Justice and Climate Debt

It is important to bear in mind that the differences between mainstream international responses to climate issues and responses at the NGO or grassroots level are not just that of size or influence, but more importantly of the fundamentals that define the proposed solutions. At that heart of the raging debate over appropriate actions on climate change are profound differences on what the best solutions are and how those solutions should be implemented. Further, there tends to be great disagreement on who should be accountable for climate based instability around the world and how the burden of the changes should be distributed. Internationally, as discussed above, there is a heavy emphasis put on market-based solution to climate change. Policy through the UN, as well as many policies put forth by developed and developing governments, support various market-based methods to mitigate and adapt to climate changes while also using these methods to fund mitigation and adaptation strategies. These methods are strongly based

in capitalist ideals and follow the very models of governance, commerce, trade and development that industrialized nations have perpetuated, causing the majority of anthropogenic climate change in the first place. And while many actors at the international level are willing to concede that the developed world has, and still is causing most of the effects of climate change, they are often hesitant or completely unwilling to curb habits that contribute to it or provide support that would offset their actions.

Alternatively, many NGO's and grassroots actors are in support of finding other solutions to climate change that would move the global community away from market-based solutions and provide more sustainable and long term coping mechanisms and alleviation strategies. Correctly, it has been pointed out by grassroots climate activists, as well as academics in the scientific field, that climate change has been structurally fueled by a global society that is based on consumption. Consumption of goods and services that are shipped back and forth throughout the world, consumption of food and other agricultural products that are grown locally only to be shipped, sold and eaten abroad, and consumption of natural resources such as fossil fuels, minerals and fresh water that are disappearing at an alarming rate. Since the turn of the twentieth century, capitalist markets, globalization and industrialization have fueled this consumption and have directly resulted in present climate issues. According to Justin Lin, chief economist at the World Bank, about 75 to 80% of the damages caused by global climate change will be suffered by developing countries, although they only contribute about one-third of the greenhouse gases (Klein, 2009, 1). Understanding these inequities, many find it unreasonable that the international community would rely on these same markets to solve

climate problems without attempting to find alternatives that would alleviate the effect of climate disasters on historically marginalized populations and move towards ending the crisis by terminating the direct contributing factors. It is within this context that two major concepts have become the touchstones of current alternative climate change solutions: climate justice and climate debt.

First, the concept of climate justice that has emerged within grassroots climate change movement is important to understand because its ideals are a major departure from what has been offered at the international level in the last decade and a half. Climate justice theories and concepts find their basis in a combination of ideals from environmental protection and social justice approaches. Dough King of The Witherspoon Society of the Presbyterian Church, USA states,

*Social justice provides the foundation for a healthy community. It grows out of our sense that each person — each created being — has value...To help the process along we develop attitudes of respect for one another. We also shape policies and patterns of behavior to protect and enhance the worth of each person. We do this by building governmental and economic structures, educational and religious institutions, and all the other systems that provide for health and social welfare (Mayer, 2007, 1).*

Rooted in doctrines of faith, as well as law and politics, movements for social justice have fought against many human rights abuses throughout the world. As it has become clear in the last several years that the effects of climate change are adversely complicating the lives of the worlds most impoverished and marginalized citizens, concern has grown that anthropogenic climate change is a human rights violation to those that it disproportionately affects. The victimization of populations who contribute little to

the causes of climate change has been an unintended consequence of globalization and an industrialized world, but nonetheless is a stark reality for millions around the world.

In reaction, various NGO's and local grassroots efforts have formed to demand a new and more specific kind of social justice that would protect the world's most vulnerable populations against circumstances which they have little ability to control. Hence the so-called movement for climate justice has found strength and momentum in the last several years. According to the website 'actforclimatejustice.org,' climate justice is defined as the following:

*“climate justice is a vision to dissolve and alleviate the unequal burdens created by climate change. As a form of environmental justice, climate justice is the fair treatment of all people and freedom from discrimination with the creation of policies and projects that address climate change and the systems that create climate change and perpetuate discrimination”* (Act for Climate Justice, 2010, <http://www.actforclimatejustice.org/about/what-is-climate-justice/>).

One of the most important principles that seem to be guiding the push for climate justice is the belief that the pressures and changes scientifically attributed to anthropogenic climate change should be seen through an ethical framework and are inherently moral in nature.

According to the organization Climate Justice Now, their principles are guided by the fact that the so-called global north has contributed to the overwhelming majority of climate change and that, up to this point, populations in the global south have borne the burden of those changes. They further believe that the solutions being offered currently from the United Nations and other international bodies such as the IMF and the World Bank are false solutions that only serve to further the interests of the industrialized world and pander to the whims of the consumer classes both in the global north and the growing

middle and upper classes in the global south. To ensure the curbing of emissions and to mitigate the climate crisis, supporters of climate justice support clean energy and an end to fossil fuel use, radically reducing consumption by both those in developed and developing countries, sustainable family farming and fishing, human rights based resource conservation and the huge transfer of financial aid from developed to developing areas. The transfer of monetary support would come through a system of so-called climate debt repayments from wealthy nations to those most affected by climate change. Based on historical emissions since industrialization, this system would transfer wealth from those most responsible for current conditions to countries with little historical emissions record. The funding would be for use in adaptation and mitigation, as well as for sustainable development.

Within the climate change and climate justice discourse the relatively new concept of climate debt is both controversial and forward thinking and a complete departure to any solution that has been offered either by the international community or by traditional climate change activists. Departing from American and other western environmentalism that tends to treat climate change as a force that transcends differences, (we all share this fragile planet and therefore the changes that are occurring), the case for climate debt actually stresses the differences, zeroing in on the cruel contrast between those who have caused the climate crisis and those who are suffering its worst effects (Klein, 2009, 1). Climate debt supporters highlight these stark contrasts and demand that something be done to reconcile them. They propose that rich and privileged nations should be forced to pay reparations to poor nations for the crisis they have produced.

Compounding the fact that many who are suffering most extensively from climate change have little to no “carbon footprint,” is that these same populations lack the funding to support clean energy resources and infrastructure, sustainable and clean development alternatives or adaptation and mitigation technologies, which are many of the very things the international community supports to curb climate change. In June of 2009, shortly before the COP 15 in Copenhagen, Angelica Navarro, the Bolivian climate negotiator, explained these difficulties at the UN climate negotiations in Bonn, Germany. She then expounded upon what she and other climate debt supporters see as a feasible solution through the international community. First, wealthy countries need to pay the costs that will be associated with adapting to climate change. Then, deep cuts should be made to their own emissions levels to make “atmospheric space” available for the developing world. And last, the developed world should facilitate paying for developing countries to leapfrog over fossil fuels and go straight to supplying cleaner and more sustainable energy sources for their citizens (Klein, 2009, 2). In recent months, climate debt theory has gained widespread support, significantly among developing governments and officials around the world. The governments of Sri Lanka, Venezuela, Paraguay and Malaysia, as well as a growing number of African and island nations have endorsed the call for climate debts to be paid (Klein, 2009, 2).

The controversial nature of the theory of climate debt is not lost on its supporters. The road towards any kind of commitment will be a long one, considering that the COP 15 did not even produce a binding commitment that would take the place of the Kyoto Protocol in 2012. Critics of the idea claim it would also be impossible to scientifically place numbered values on the emissions of nations currently and would be even more

impossible to do so in a historical context. Yet, climate debt has the potential to be far more concrete than most skeptics give it credit for. Antonio Hill, who is the senior climate advisor for Oxfam says “what is exciting is you can really put numbers on it. We can measure it in tons of CO<sub>2</sub> and come up with a cost” (Klein, 2009, 2). Yet a study from 2008 out of the Netherlands correctly points out the further difficulties for climate debt supporters, as the responsibility for greenhouse gas emissions begins to shift from solely industrialized countries to more developing countries like China and India.

*“The change in relative cumulative contributions will alter the ethical parameters of the debate on climate policy. In the near future the responsibility for the ‘climate debt’ will be shared by the largest emitters at this moment-Western Europe and the USA- and rapidly developing countries, such as India and especially China. Based on these projections, it is vital that [countries like] China and India participate in future climate agreements” (Botzen, 2008, 570).*

### 3. Major Disagreements with Mainstream International Climate Solutions

For a growing number of people the solutions offered by the international community are inadequate to deal with the effects of climate change and frustrations with the actions, or inactions of the international community and developed nations are mounting. NGO’s, grassroots activists, locally based groups and developing state leaders are increasingly criticizing many components of the frameworks being agreed upon through the UN and are critical of the UNFCCC and the COP meetings themselves. Market-based solutions, adaptation and mitigation funding, REDD, and the inadequacy of technology transferring mechanisms have all come under fire as ill equipped, misguided answers to one of the futures greatest dilemmas.

Generally speaking, the entire international framework for curbing and dealing with climate change has been questioned by climate change activists and by developing

countries. The apparatuses that have been put into effect by both the UNFCCC and the COP in the last several decades are seen as insufficient primarily due to their non-binding status. Optimism had run high after the Kyoto Protocol but most of the steps taken internationally since then have been woefully inadequate. Furthermore, in a report called International Climate Policy Post-Copenhagen, the European Commission confirmed that the pledges by developed countries are currently equal to between 13.2% and 17.8% in emissions reductions by 2020-far below the required 40% that Kyoto strove to enforce (Romero, 2010, 1). Adding to the frustration is the fact the Copenhagen Accord has been propped up internationally as a success while it is gravely insufficient. It actually allows for an increase in developed countries emissions of 2.6% above 1990 levels and instead of being legally binding it allows countries to submit their own targets (Romero, 2010, 2).

Those who counter the international response to climate change also disagree with the abundant use of market-based solutions. It has been made clear that anthropogenic climate change has occurred largely due to the stresses and strains created by an industrialized, consumption based global marketplace that relies heavily on the tenets of capitalism to drive it. Therefore, it is troubling to many climate justice proponents and developing country citizens that the solutions to the crisis would be market-based. In a paper addressing climate change, Evo Morales, president of Bolivia and an indigenous Aymara said, “In the hands of capitalism everything is a commodity: the water, the soil, the human genome, the ancestral cultures, justice, ethics, death...and life itself. Everything...can be bought and sold and under capitalist even “climate change” itself has become a business” (Morales, 2010, 1). Here he summarizes many groups’ frustrations

with market-based solutions that rely on carbon markets and cap and trade to solve climate change issues.

Gustavo Castro Soto is the founding member of Otros Mundos, an NGO that works on popular education and developing alternatives to capitalism, as well as with the Mexican Network for People Affected by Mining (REMA). When asked to discuss his group's feelings on market-based solutions he replied,

*“Our political position is very clear: clean development mechanisms don't work. With them the appropriation of indigenous and peasant territories is justified, deforestation is justified, and as well, the very projects of transnational companies are carrying out for profits are justified. These projects include ecotourism, highways, forest plantations, bio-fuels, hydroelectric dams, and mining, they just kept looking for justification, and not just legal justification through free trade agreements, but justifications related to climate change. Our position is very clear. Bio-fuels, large monoculture plantations, dams, and mines don't fight climate change, they significantly accelerate it” (Paley, 2010, 2).*

In addition to major criticism over the ineffective nature of the UN and international responses, concern has also been voiced over several more specific areas of climate change responses. Two of the most well known mechanisms for attempting to combat both further climate changes and assist those dealing with the changes are adaptations and mitigation. On the surface both of these mechanisms seem like viable solutions to both curbing and adapting to climate change. Yet criticism is often voiced not over the fundamental ideas of these two methods but over their implementation and ineffective nature. First, it is cited that, many times funding and resources are unfairly distributed and that more funding is directed towards reducing emissions and mitigation and far less is allocated for reducing the effects of climate change and adaptations. The unfortunate result of this funding imbalance is that developed countries are seeing more

funding than developing countries that need the help in a far more urgent way (Morales, 2010, 1).

Recently in 2009, Oxfam International produced an extensive study on adaptation mechanisms that highlighted many of the downfalls and provided a concise summary of the many frustrations that are felt over climate change resources and funding. Generally, the report found that current aid falls far short of what is required (Pettengell, 2010, 11). “The result is high costs for developing countries, low transparency, poor accountability of donor governments, no national ownership, and a woefully inadequate level of funding reaching projects on the ground” (Pettengell, 2010, 11). The critique is based on the fact that the aid strategies for adaptation are based on an existing international aid structure that is already inadequate and inappropriate. The report further sights three main problems with the delivery of adaptation aid. First, the aid is given through what they call a “spaghetti bowl” of funding channels that creates confusion and high transaction costs for the recipients. Secondly, the aid is not demand based, meaning that much of the aid is directed not to those most in need but to areas that donor countries choose, which leaves gaps in some places and over funding in others. Lastly, and most troubling is the underfunding and empty pledges by donor countries. To complicate the lack of commitment, when funding is available, cumbersome procedures create further hurdles to accessing the funds (Pettengell, 2010, 11-13). In short, the bureaucracy that surrounds adaptation and mitigation make a potentially viable solution frustrating and insufficient.

The concept of technology transfers from wealthy and more scientifically advanced nations to those attempting to adapt to climate change has also come under some scrutiny, especially by those countries in desperate need of the advances. Again, like the

ideas of adaptation and mitigation, it is not the technology transfer or the science itself that has come under attack, but the way in which it is accessed and distributed. Many technologies related to dealing with the effects of climate change are in fact under private domain and are often patented by corporations. This system blocks the free flow of innovation and technology vital to adaptation and mitigation from getting to those who need it most. The technologies that are patented additionally come with a price for their use that make them more expensive for developing countries that are often financially unstable and can create an inability for the technology to be obtained (Morales, 2010, 2). These obstacles put in place by developed countries simply serve to enforce a market based approach to adaptation and mitigation, impede effectiveness and add another place where funding must be diverted.

Possibly the most controversial of all of international solutions to curbing GHG's and alleviating climate change is the REDD program. Critics of the program, largely comprised of indigenous communities and their supporters, cite several reasons that the REDD program, as currently defined, is problematic. First, there is the inherent weakness of the definition a "forest" is under the REDD program. As it stands now, the definition of a forest includes not just naturally preserved forests that have remained intact in the face of massive deforestation over the last several centuries, but also industrial tree plantations that have been planted where natural forests no longer exist. According to numerous NGO groups, the consideration of these spaces as actual forests is and "egregious error...Plantations are not forests. Forests are diverse ecosystems and plantations are void of biodiversity. The UN definition endangers Indigenous Peoples,

forest dependent people, peasants, small farmers, biodiversity and exacerbates climate change” (Global Justice Equality Project, 2008, 1).

According to The Global Canopy Program, future aims for REDD mechanisms include the conservation of biodiversity (Parker, 2009, 12). Yet, by allowing, and then rewarding governments to replace deforested areas with agricultural tree crops instead of ensuring the regeneration and protection of forest ecosystems, the UN is facilitating a great disservice to biodiversity. Although planting tree farms in deforested areas would technically deliver some positive impacts on emissions by serving as man made carbon sinks, they only provide a short term and an unsustainable answer to deforestation and emissions capturing. Tree farms promote monoculture trees as a commodity, a process that increases pesticide use, can be detrimental for soil health and can harm water runoff. Through REDD, the international community should seize opportunities to improve biodiversity by enforcing more strict deforestation policies and reforesting areas to curb emission. Such policies would, by extension, support forest dwelling and indigenous peoples and their livelihoods. The goals of REDD should aim to create long-term strategies and sustainable solutions that would promote this while steering clear of commodity driven schemes that further harm biodiversity and ecosystems.

Furthermore, there is great concern within indigenous and forest dependent peoples that REDD will infringe upon indigenous land rights and human rights conditions in forest regions. Tom Goldtooth, director of the Indigenous Environment Network in the United States has voiced opposition to the REDD project. He and his organization oppose the project because it lacks guarantees for respecting indigenous lands and because the communities that are involved can end up renting their traditional lands and renouncing

their own property (Chavez, 2010, 1). Native peoples fear that they will inevitably lose what little land they have and that they will not benefit from UN rewards through REDD even though they have protected the forests effectively for centuries. Camila Moreno of Friends of the Earth has gone so far as to speculate that “the system of credits was created to permit the entry of international agencies and to monitor people’s lives, and then to create a financial mechanism for negotiating rights with speculative ends” (Chavez, 2010, 1).

Unfortunately, last years events at the COP 15 in Copenhagen did little to assuage the fears for those skeptical of REDD. In fact, the summit actually weakened the language of REDD and left both existing forests and indigenous peoples vulnerable after the Copenhagen Accord. NGO’s that attended the summit criticized it for removing key protections for rainforests and downgrading language that was meant to support and protect local forest communities (McDonald, 2009, 1). In the draft text of the accord that was agreed upon after three days of closed-door discussions, the objective for reducing deforestation by at least 50% by 2020 that had been included in an earlier pre-Copenhagen draft of the REDD document had been totally removed (McDonald, 2009, 1). The Copenhagen Accord also lacks a plan for funding the REDD program, aside from a handful of short term funding arrangements. Also, safeguards that protected biodiversity and indigenous rights had been greatly weakened by being moved to a non-binding section of the Copenhagen text.

According to Accra Caucus, a group of over 100 NGO’s in more than thirty countries, the overall objective of REDD is to halt deforestation and should include the

following: a target for ending deforestation by 2020, protection of intact natural forests and their biodiversity, support of restoration of degraded natural forests, recognition that plantations are not forests and should be excluded, action against the real drivers of deforestation, no benefits to large scale industrial activities like logging, cattle ranching and agro-fuel production, policies and measures against demand side drivers of deforestation, including trade agreements, and assurance that they do not contradict or undermine the goal of halting deforestation and degradation (Lang, 2010, 1). Without these types of measures it is feared REDD will fall short of protecting forest and curbing climate change.

#### 4. The Alternative Climate Summit and Alternative Solutions

With mounting opposition to the solutions offered at the international level, concerned parties have begun to rightfully ask what alternative solutions could be presented and how they would be most effectively implemented. After all, it seems fruitless to openly, and at times scathingly criticize the efforts of the UN and other international and state bodies without actively contributing to the climate crisis dialogue. In order for criticism and alternative solutions to appear credible and convincing the skeptical groups must create viable options for alternative change. In an attempt to create an atmosphere of open debate and dialogue that could facilitate such ideas, as well as put change into motion, The World People's Conference on Climate Change and the Rights of Mother Earth was held in Cochabamba, Bolivia over three days in April of 2010. In response to the lack of access that many NGO's and other interested parties received during Copenhagen COP 15 in December, Bolivian President Evo Morales proposed

hosting the conference as a forum for those left frustrated and disappointed by the lack of a binding agreement after Copenhagen. And so it was with this effort that environmental, climate justice, indigenous rights and human rights groups, as well as other varying participants from 150 different countries joined government representatives and several heads of state for the event (Eshelman, 2010, 1).

The goals of the conference were multifaceted and included analyzing the structural causes of climate change, proposing alternative models for living harmoniously in nature and dealing with the climate crisis, drawing up a Universal Declaration for the Rights of Mother Earth, building a mechanisms that would provide an international referendum on climate change, and developing a proposal for an international Climate Justice Court (Eshelman, 2010, 1). A system of seventeen working groups was devised to divide the summit into manageable sections that ranged from deforestation issues to appropriate technology transfers to climate migrant issues. The working groups convened every day for discussions with the goal of eventually providing a statement of intent that would inform the final Mother Earth Rights document. The conference also boasted prominent environmental and social justice figures who held panel discussions, classes and debates that addressed hundreds for topics. Crucially, the conference argued one overarching point, that the conversation about climate change and the strategies to deal with it needed to be broadened and not narrowed and that traditionally marginalized voices must be included in a vital dialogue that should include each and every human affected by the climate crisis (Eshelman, 2010, 2).

The outcomes of this conference of peoples from all over the globe should not be understated. First, it was the first conference of its kind to join activist and other

concerned parties from all over the world. It created a forum for both people of power and average citizens to express their views on the problems and solutions of climate change. Further, the creation of the final document, commonly referred to as the “Peoples Agreement,” articulated for the first time in one place, the goals and aspirations of a movement for alternative solutions to the climate crisis. The document, unique in itself, addresses climate change through a different lens than is commonly used within the international arena. It looks at climate change not just as a problem limited to a rise in global temperatures, but ventures to question the structural causes behind the acceleration of climate change. Highly critical of the ways in which capitalism have influenced and shaped global and international policies, the Peoples Agreement states:

*“The capitalist system has imposed on us a logic of competition, progress and limitless growth. This regime of production and consumption seeks profit without limits, separating human beings from nature and imposing a logic of domination upon nature, transforming everything into commodities”* (Peoples Agreement, 2010, 1).

Conference attendees examined the nature of an economic system that has fueled anthropogenic climate change and the incompatibility of this system with the ending of the climate crisis.

The solutions offered by the Peoples Agreement are numerous and begin with suggestions for the strengthening of international apparatuses that deal with the environment and indigenous rights. First, the agreement calls for the complete recognition of the UNDRIP as a whole and pushes for universal recognition of the document. If countries were able to follow the regulations set forth in the UNDRIP, many of the environmental rights violations against indigenous peoples would be ended. The agreement also calls for the creation of an International Climate and Environmental

Justice Tribunal that would have actual binding and legal capacity to prevent, judge and penalized states, industries and individual persons that blatantly and without regard provoke climate change. It is also suggested that supporting states would be willing to bring claims to the tribunal that would indict nations who have not complied with commitments under the UNFCCC and under the Kyoto Protocol to reduce their impact of GHG's into the atmosphere (Peoples Agreement, 2010, 7). This section of the document is calling for some form of binding commitment similar to what was promised but not achieved through the COP 15. In the establishment of a body that would actually have legal power, victims of climate change would have a forum in which to bring grievances and States and industries would feel far more compelled to comply with laws, commitments and regulations in the fear of actually being held accountable for their failures.

The concepts and theories of climate debt to facilitate solutions that are both ethical and productive were discussed at length during the alternative summit. There was a specific working group that dealt with the issue of climate debt and repayment for historical abuses by developed and industrialized nations. The summit was largely in support of beginning a system of climate debt repayments that would largely go towards both adaptation and mitigation funding in developing countries. Further, the Peoples Agreement found fault with current funding models that are being directed toward development for climate change solutions. In addition to Official Development Assistance and public sources, the agreement calls for new annual commitments of at least 6% of developed countries GDP's to tackle climate change. This is much more than any country is currently giving annually but many developed countries spend similar

amounts on national defense every year and recently have spend billions on corporate and banking bailouts (Peoples Agreement, 2010, 1). In keeping with climate debt ideals, this money would be free of conditions and would not interfere with national sovereignty or the self-determination of the most vulnerable and affected groups.

In sum, the summit supported the assessment and eventual payment of climate debts as well as a rethinking of national spending by developed countries. With a reprioritization of monetary spending the financial backing needed to both adapt to and mitigate climate change could be achieved. On top of any climate repayment schemes that would be put into place, the Peoples Agreement calls for the construction of an Adaptation Fund “that exclusively addresses climate change as part of a financial mechanism that is managed in a sovereign, transparent, and equitable manner for all States” (Peoples Agreement, 2010, 4). This fund would assess the impacts of climate change on developing countries and would also include some kind of mechanism for compensation due to current and future damages, loss of opportunities due to climate change and any additional costs that present themselves (Peoples Agreement, 2010, 4).

In addition to stronger international regulations and more effective funding channels for those in need, the agreement focuses on the importance of both technology and of forested regions. First, the document does not support the idea of “technology showcases” that have been proposed by developed countries under the UN, which would market technological advances to peoples in developing areas. This method would demand that states already struggling financially to deal with climate change would have to then pay for the technologies that might be able to alleviate climate pressure and save lives. Instead the document supports the “establishment for guidelines in order to create a

multilateral and multidisciplinary mechanism for participatory control, management, and evaluation of the exchange of technologies” and that “these technologies must be useful, clean and socially sound” (Peoples Agreement, 2010, 7). Likewise, it supports a fund to finance the invention of technologies that are appropriate and free of intellectual property rights. With these commitments the sharing of solutions would be encouraged and valuable funding would be directed in other more fruitful directions.

In the wake of much controversy over REDD policy, the agreement also addressed what should be done about forest areas around the world. The view that prevailed at the summit was that polluting countries should have the obligation to carry out direct transfers of both economic and technological resources that are and will be needed to pay for the restoration and maintenance of forests and support the livelihoods of indigenous and other native forest stewards (Peoples Agreement, 2010, 5). This funding should again be direct and outside of the establishment of carbon markets and should not serve as carbon offsets. The summit also supported countries abandoning REDD stewardship methods in exchange for the development of programs that would create the restoration of forests and jungles through native management and implementation of seeds, fruit and native flora, not tree plantations (Peoples Agreement, 2010, 5).

There was also a working group that focused on the issue of environmentally induced migration and the effects of climate change on the movement of displaced peoples both within their home countries and abroad. Environmental degradation and climate change have created an entirely new category of people who are being forced to relocate themselves either temporarily or permanently. According to projections there

were already about twenty-five million climate migrants in 1995. Presently, estimates put the population at approximately double that. Looking to the future, estimates range anywhere from two hundred million to one billion people who will be displaced due to environmental factors by 2050 (Peoples Agreement, 2010, 6). This massive problem obviously needs to be addressed and the summit provided two different steps that should be taken in order to aid and protect these increasingly vulnerable populations. First, developed countries should consider assuming responsibility for climate migrants, accepting them into their territories as environmental refugees and recognizing their fundamental human rights that are protected by existing international conventions. Further, the document supports the creation of an International Tribunal of Conscience that would denounce, make visible, document, judge and punish violations of the rights of migrants, refugees and displaced persons within the countries of origin, transit or destination. This mechanism would clearly identify the responsibilities of states, companies and other actors (Peoples Agreement, 2010, 6).

One of the most frequently discussed topics both at the summit and within the subsequent document was the importance of recovering indigenous knowledge to support new ways of living in nature that would reduce human impacts on the planet. The approach of revitalizing and following indigenous traditions would have two positive outcomes. First, it would support ways of life that are currently in danger of disappearing in a rapidly globalizing world. And second, indigenous traditions would encourage living closer to the land, lowering our anthropogenic impact and hopefully reduce the rapidity in which climate change is occurring. According to the text, “the world must recover and re-learn ancestral principles and approaches from native peoples to stop the destruction of

the planet, as well as promote ancestral practices, knowledge and spirituality to recuperate the capacity for “living well” in harmony with Mother Earth” (Peoples Agreement, 2010, 7).

A good example of an area where indigenous and ancestral practices would create significant changes that would be positive for the environment would be through agriculture. Currently, the majority of the worlds food supply is manufactured by large agribusiness, with the goal of producing food not for nutritional purposes, but to fulfill market expectations and serves as one of the biggest contributors to global climate change (People Agreement, 2010, 5). In order to reduce GHG emissions and support a healthier and more local food supply, the international community should support a profound shift in agricultural practices, supporting the sustainable models of production that have been used by indigenous peoples all over the globe for centuries. This would also extend to support populations having control over their own seeds, lands, water and food production and would bolster food sovereignty (Peoples Agreement, 2010, 4). In addition, states should give legal recognition to claims over territories, lands and natural resources that will enable traditional ways of life to flourish and contribute to dealing with the climate change dilemma. Finally, indigenous peoples specifically should be offered full consultation, participation and prior consent in all negotiation processes related to measure of climate change policy, especially when those measures involve indigenous territories or resources (Peoples Agreement, 2010, 6). This consultation would allow the flow of indigenous knowledge of the natural environment to reach the

international level, especially to the UN, and would positively inform climate policy decisions.

Finally, and possibly the most interesting of the alternative suggestion developed at the summit was in support of a global referendum on climate change issues. The summit and the Peoples Agreement stemmed from a belief that the crisis that faces the world due to global climate change affects every living human being and is therefore something that all people should be engaged in. The decisions made about policy solutions concern all people and a global referendum would allow everyone to weigh in on the issues. The referendum would address the following issues; “the level of emission reductions on the part of developed countries and transnational corporations, financing to be offered by developed countries, the creation of an International Climate Justice Tribunal, the need for a Universal Declaration of the Rights of Mother Earth, and the need to change the current capitalist system” (Peoples Agreement, 2010, 7). Though billions of people around the globe are concerned with providing food, water and shelter to their families and have little time for politics or other international affairs on a daily basis, they are the populations most affected by climate change and have acute knowledge of the ways in which those changes are effecting their most vital of resources. Therefore, it seems only logical that the international community find some way, no matter how daunting the task, to include their voices in the dialogue over climate change and climate change policy.

Much like the UDHR, the Peoples Agreement is aspirational. It offers alternative solutions in the understanding that the suggestions made aim infinitely high and may never be fully accomplished. Yet, the hope of those who attended the Peoples Climate

Summit is that those attending the COP 16 in Mexico in 2010 will take the adoption of this document or something similar into consideration. It is also hoped that the developed countries listed in Annex 1 begin to respect the existing legal frameworks they have signed onto and reduce their GHG emissions, as well as that the different proposals contained in the Peoples Agreement will be adopted through existing international bodies (Peoples Agreement, 2010, 8).

## CHAPTER FIVE: CONCLUSIONS

### 1. Summary of Major Findings

There are several overarching and pivotal findings that have become apparent through the research conducted for this thesis. First and foremost, it has become exceedingly clear that global climate change acutely affects poor, historically and structurally marginalized populations with different and more extreme impacts than other populations. Conversely, developed and exceedingly industrialized developing nations are disproportionately contributing to the acceleration of climate change. The poor and marginalized groups include indigenous peoples around the world, with a diverse segment situated in Latin America. The region was an interesting case study of the effects of climate change on indigenous peoples because it is so geographically and culturally varied. With hundreds of different indigenous groups living in the region, their experiences and struggles are diverse and complex. Yet, many groups share common histories, similar belief systems and analogous local political and social structures that create commonalities. Indigenous groups in Latin America have struggled with an oppressive colonial past that has left them impoverished, deprived of political power and ill-equipped to deal with the negative political, economic and social effects of climate change. These effects include warming temperatures, decreased precipitation, rising sea

levels and more severe weather phenomena. These effects have contributed to existing hardships in the region and have profoundly affected many aspects of life for indigenous communities.

In this context, the issues of climate change and their disproportionate effects on indigenous and other marginalized populations should be addressed as a human rights violation. The UDHR, Article 25:1 states,

*Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control* (UN, 1948, <http://www.un.org/en/documents/udhr/index.shtml>)

Though there are many rights guaranteed in the UDHR that indigenous peoples have almost always lacked (ie: medical care, social services), this passage is especially important because of the reference to ‘circumstances beyond his control’. Indigenous peoples are acutely suffering from ‘a lack of livelihood in circumstances beyond their control’ due to climate change perpetuated by outside forces. This research has expounded upon the fact that indigenous peoples have an exceptionally minimal effect on the processes that lead to drastic climate change. Yet, developed and industrialized nations have historically and continue presently to exacerbate climate change and, by extension, negatively affect the livelihood circumstances of other groups. The infringement of rich and privileged societies on the rights of indigenous peoples through the continuation of irresponsible environmental actions is a moral issue. It is ethically objectionable that certain groups continue to reap the benefits of these actions while others are unable to attain the most basic level of human rights. Many of the principal

contributors to climate change are unwilling to frame the issue in ethical terms. Therefore, as in times past, the human rights community must find ways to frame it as a moral concern. In order to draw attention to the inequities and injustices of climate change, stronger focus should be placed on the infringement of climate change on basic human rights.

Secondly, this research has illuminated the specific crisis of resource allocation and distribution that climate change has caused for indigenous peoples in Latin America. Indigenous peoples are found throughout the region, mainly living subsistence livelihoods, where they grow their own food, maintain water supplies and govern their own land use policies (though sometimes one or all of these is interfered with by state actors). Most communities live close to the land and have maintained the same systems and practices for generations. Yet now, climate change has created unpredictable and unreliable weather patterns and other complications that are interfering with traditional practices. Many indigenous populations are struggling to maintain agricultural yields, collect water for drinking and irrigation or preserve healthy land and soil. Climate change has increased the risk that once thriving and healthy communities will be forced to leave their lands. In some cases, entire communities have been lost. Indigenous peoples in the region have an intense connection to their land, the food it produces and the water that sustains it. For many, resources define identities while simultaneously sustaining livelihoods, making resource allocation paramount to indigenous cultures. The threat to these resources from climate change is therefore a stark reality in Latin America.

Lastly, this research has established that, while action is being taken at the international level to deal with climate change, the system is greatly flawed and has fallen

short of providing the mitigation needed to curb climate change and adapt to its worst effects. The UN, developed nation states and other international actors have favored a plethora of market-based solutions to both mitigate and adapt to climate change. Relying almost entirely on these types of solutions can be viewed as problematic for several reasons. First, heavily favoring market-based solutions to climate change issues employs the same market models that have led to climatic pressures. Anthropogenic climate change has been fueled largely by industries and nations that promote consumptive practices, the reliance on global marketplaces and industrialization. If market-based policy initiatives had proven effective at curbing emissions and slowing climatic change in the last two decades, this might seem less problematic. But this research has shown that these policy choices have not created the change needed and presumably will continue to be unsuccessful as long as actors do not feel compelled to comply with internationally set goals and standards. It would seem more effective to look, at least in part, for solutions outside of such markets that would less likely be dictated by or rely on powerful state and corporate actors. In future research, I would like to explore international frameworks to see what, if any, effective apparatuses exist or are being promoted at the international level for incentivizing responsible emissions reductions outside of market-based programs.

Also, market-based solutions often alienate indigenous and other marginalized communities. Many times these communities have little access to global markets, making participation in them difficult. Aside from a lack of access, some indigenous communities wish to remain separate from national and international markets and institutions that have served to disenfranchise their communities and harm their environments in the past.

Industrialized and developed nations hold the onus for most of the planets climatic changes, and it is those groups who should consider making larger economic sacrifices than they are at present. This would include changing habitual market-based tendencies and yielding to alternative solutions that would be more inclusive of indigenous peoples, more quickly curbing emissions.

Solutions like cap and trade programs and REDD cannot realistically be abandoned due to their entrenchment within international climate change frameworks and their popularity among powerful actors who need to be fully involved with the international climate change agenda. Yet this should not mean that ideas for alternative solutions that could add to the equitability and effectiveness of climate change strategies should not also be considered. The UN often struggles to mandate practices that achieve the goals set forth within their policies. This is often due to a lack of authority at the UN level and also to the historical uncooperative nature of powerful entities, specifically the US. Yet, if pressure from civil society and the grassroots international community was recognized by the UN and then articulated to important and powerful international actors, there would be a chance that demands from below could change the actions of those with power and influence. Strong and continuous civil disapproval, brought forth through the UN, could be a catalyst for developed nations and corporations to be compelled to change their standards and practices in order to curb emissions and to meet agreed upon goals.

In addition to exclusionary and weak solutions through international channels, the UN climate programs struggle with transparency issues, a lack of funding and international commitment, painfully slow and cumbersome decision making processes and a lack of overall legitimacy and normative strength that bog down the system. The

UN struggles on all fronts with creating policy decisions in a timely fashion and is constantly battling the enduring uncooperativeness of the US. Unfortunately, climate change is an issue that the international community needed to have effective solutions for years ago. This crisis is revealing itself as one that will be increasingly difficult to attack. In reaction to stagnation at the international level, this research has also found a burgeoning movement to create alternative solutions to climate change issues. These solutions are both local and international in scope. They come from a grassroots movement that seeks to have both their complaints and suggestions heard by the UN and developed nations. Because the globalized international community plays such a large role in fueling climate change, as well as in setting climate change policy, it is unrealistic to think this grassroots movement can, at this point, bypass international actors to solve climate problems. But alternative solutions, including those from indigenous populations, could be given a larger role in climate discourse in order to create a more robust and well-rounded conversation that would include varied knowledge, ideas and narratives. This would, perhaps, provide a multifaceted set of solutions that would address climate change more effectively than at present, possibly combining solutions from both market-based and non-market-based perspectives.

## 2. Discussion

First, I believe that many benefits would arise from a meaningful and cooperative relationship between indigenous groups and international bodies like the UN. Though some recognition has been paid to indigenous peoples, the international community, especially the UN, could do far more to incorporate indigenous peoples into international

climate change policy and discourse. Through unique perspectives and livelihood models, indigenous peoples could supply alternative viewpoints and knowledge that would help to broaden international climate change dialogue. The openness to include these perspectives, and especially environmental knowledge, would do several things. First, more indigenous representation would hopefully provide a balance between market-based solutions and alternative narratives being promoted at the grassroots level. Also, indigenous community members would bring first hand experience about the struggles and misfortunes that climate change has created, along with the experiences of adapting to them in their daily lives. These experiences could provide insight into alternatives, or at the very least provide more balance among opinions. In addition, promotion of indigenous knowledge could have a positive effect on international science and policy work as a whole.

The in-depth and valuable knowledge of weather, ecosystems and the natural world that indigenous peoples have could be invaluable to both scientists and policy makers, bringing forth knowledge and experience that could benefit climate solutions. Policy on climate change at the UN level is inextricably linked to the work of UN scientist who spend months, years, and even decades in the field all over the globe documenting climate phenomena in order to explain climate change. Policy is supported or refuted with this valuable scientific knowledge and is vitally important to international level choices that are impactful on mitigation and adaptation. But even the best western

scientists have shortcomings and could benefit from indigenous traditional understandings.

Scientist Shari Gearheard, a geographer and a researcher at the National Snow and Ice Data Center in Boulder, Colorado, has worked in the Canadian Arctic alongside the Inuit indigenous peoples for fifteen years. She has become a member of the Clyde River community in Nunavut, Canada and has fostered strong personal and professional relationships with the Clyde River population. In her scientific work she has found that native hunters, fisherman and village elders are keen observers of weather and ice patterns and have much knowledge that is useful to herself and other scientific researchers (Grossman, 2009, <http://blogs.nationalgeographic.com/blogs/news/chiefeditor/2009/12/using-indigenous-knowledge-for.html>). She claims the Inuit are peripatetic travelers, even in harsh weather, logging in their heads observations on a much finer scale than most western scientists. The indigenous peoples sometimes have noticed weather and ice patterns that scientists have not even thought to study. An interesting example of this was when Inuit hunters she interviewed brought up their concern for seals sinking rather than floating in the seawater after they were speared for food. This seemed an odd observation but Gearheard soon realized that the hunters had unexpectedly discovered the changing salinity in the water, caused by an influx of freshwater from melting glaciers. The less salty water could no longer float the animals (Grossman, 2009, <http://blogs.nationalgeographic.com/blogs/news/chiefeditor/2009/12/using-indigenous-knowledge-for.html>).

It is examples like this that show the value of collaboration between western science and indigenous observational knowledge. In turn, the science and study of global climate change is of paramount importance to policymakers, influencing choices at the UN level. Through greater scientific collaboration with indigenous communities, the UN could increase its cooperation between local level communities and recognize the importance of indigenous voices in the processes of climate change mitigation and adaptation. Indigenous hunters and elders around the globe have similar knowledge that, if discovered and utilized by scientists like Gearheard, could be of immense help for UN scientists and could influence policy. Though these experiences may seem small, they could have great contributive effects on the depth of environmental understanding and climate change science.

The international community has also made commitments to the human and indigenous rights of these communities and has often fallen far short of protecting them. By opening a more extensive dialogue with these marginalized and struggling communities, international bodies would come closer to respecting the rights of indigenous peoples, while amplifying their voices in policy and decision making. Current actions to confront the issues of climate change are failing and the international community would benefit from new perspectives and ideas that have not yet been explored. I believe that indigenous perspectives could positively inform the direction in which climate change negotiations should move. Further, a more comprehensive inclusion of indigenous knowledge and attempts to include alternative solutions could have the potential to satisfy detractors of current UN policies and could possibly bring more people from the international grassroots movement on board with UN proposals.

In addition to allowing a larger role for indigenous peoples in international climate discourse, this research has impressed upon me the crucial importance of indigenous knowledge as a whole for climate change science, policy and discourse. Traditional knowledge bases not only have deep and intrinsic value in and of themselves, but also could have a profound impact on the solutions for climate change on both a local and international level. Though this research has focused on communities solely in Latin America, native communities around the world have an amazing amount of knowledge and understanding to offer that could be implemented. Indigenous communities tend to live closely tied to the land on which they live, relying on traditional knowledge to sustain successful rural livelihoods. In an increasingly globalized and industrialized world, billions of people live in cities where food is bought in stores, water comes from a faucet and our interaction with nature is generally limited to recreation. Many of our lives are isolated from nature, with no understanding of how our food is grown, how our resources are obtained or how we affect our ecosystems. With this reality, great benefit could come from allowing both our daily lives and our responses to climate change to be influenced and informed by those who live more closely to the natural world.

As evident in the above example of indigenous Inuit knowledge on scientists working in the arctic, indigenous knowledge is based on generations of understanding shared between family members and communities. It utilizes acute senses of observation and traditions of strong oral history and collective memory. This knowledge is intrinsically valuable, but can also provide important historical insight. Indigenous peoples are not only valuable to inform science but to aid in the conservation and preservation of ecosystem maintenance and biological diversity. Through the UN and a

multitude of civil society actor groups, the global community has increasingly recognized the importance of biodiversity and the value of cultural diversity. It is at the intersection of these two principles that a third emerges, biocultural diversity, which provides an illustrative example of the importance of indigenous knowledge for both biological diversity and, by extension, climate change.

Biocultural diversity is the diversity of life in all of its forms, biological, cultural and even linguistic. Recent research has shown that places around the globe with the most biological diversity also happen to be the places that enjoy the most cultural and linguistic diversity. Over 95% of the world's high-biodiversity areas overlap geographically with lands claimed by culturally diverse and indigenous peoples (Alcorn, 2008, 44). By physically mapping both biological and cultural diversity, their overlap is apparent, especially near the equator where both biology and culture are especially thick. The overlap that exists is important to recognize, of course, for the obvious positive impact diverse indigenous cultures have on the biological diversity. But it can also be seen in connection with climate change issues. There are several reasons for the international community to pay attention to this intersection of indigenous communities and biological diversity in the face of climate change: first they are effective at safeguarding the environment, avoiding or mitigating climate impacts by enduring the continued protection of ecosystems. The Surui peoples of Brazil are an example of this. Also, they have potential adaptive powers, providing corridors for ecosystems and species migration that will inevitably occur as a result of changing climatic conditions. And more intrinsically, their communities and cultures contain the basis for resilience

that communities around the world will need in order to deal with climate change (Kothari, 2008, 37).

This research focused significantly on the importance of resources and has made clear the fact that resource obtainment is critically challenged by climate change. In light of this, I support the incorporation of indigenous resource management practices, at least in part, at both local and international levels. Fundamentally, resources are being dramatically affected by climate change and in turn, indigenous communities are being affected by resource problems. Yet, it must also be noted that many of the resource allocation strategies propagated by the globalized world directly contribute to the acceleration of climate change. So the resource problem exists in both directions. This is illustrated most poignantly by the predominant methods of food production throughout the industrialized world, which are done through large agribusiness and are taxing on the environment in a number of ways.

Industrialized farming utilizes intensive pesticide use, which can have damaging effects on entire ecosystems, including human populations. These huge agricultural manufacturers use monoculture planting practices that are hard on land and are harmful to soil health and productivity. Additionally, these practices are extremely water intensive, often requiring massive amounts for dry and arid soil with little nutrients remaining. Moreover, many large agribusiness crops are shipped far distances, adding to carbon outputs and impacting GHG emissions. Unfortunately, the current ways in which the world produces most of its food are some of the largest detriments to our planet and directly contribute to further climate change.

Conversely, small-scale farming, including that of many indigenous communities, relies on sustainable agriculture that is far less impactful on land, water resources and the environment. Generally implementing a diverse set of crops, utilizing crop rotation, applying fewer chemicals and relying on local irrigation systems, small-scale farming has fewer implications for the environment and surrounding ecosystems. They also create far fewer climate change impacts. These practices have many positive effects including supporting local markets, creating social cohesion, producing seed and crop varieties and preserving healthy soil composition through crop rotation. Small-scale farming by indigenous communities is done for both subsistence livelihoods and for domestic and even international agricultural markets. Though the entire world's population could not, at this point, survive on small-scale agricultural production alone, it seems important to seek to incorporate these less harmful and more sustainable practices into the global food system. At the agribusiness level, it would be beneficial to employ more organic methods, crop rotation and diversified crops. These methods are often shunned because they are not as cost effective for big agribusinesses, but in the long run they would stand to improve soil quality, ecosystem health and reduce overall GHG emissions.

Small-scale practices and indigenous knowledge would be even more applicable on the growing phenomenon of urban agriculture. Much of the world's population lives in highly populated cities and urban centers. Urban dwellers have become accustomed to produce, meat and dairy products coming from locations far from the city, or from across the world. Yet in order to reduce GHG emissions, urban areas could attempt to, at least in part, localize their food supplies. The practices and knowledge of rural indigenous farmers could potentially provide educational materials for both urban gardeners and

small-scale producers outside of city centers on how to conserve water, manage pests and produce larger yields, among other small-scale farming techniques. Sharing knowledge about agriculture and other resource management issues could be one way for the UN to incorporate indigenous peoples into climate discourse and promote GHG reductions in cities across the world. This too, would illustrate a very positive side of the globalized international community where indigenous peoples could share valuable agricultural and environment insight with other groups that would benefit from their wealth of experiences.

In conclusion, this research has been vital in my understanding of both the region of Latin America and the indigenous peoples who live there. My comprehension of the grave realities of climate change on the population is now more robust and I found a human rights framework for indigenous and climate change issues extremely helpful. Overall, I support the further inclusion of indigenous peoples and their narratives at the international level, especially within the UN, to both improve climate change policies and the status of indigenous peoples. I recognize now more than ever the importance of indigenous traditional knowledge in all facets of climate change science and policy and its importance for the development of creative alternative solutions. Finally, I encourage the use, at least in part, of indigenous systems of resource distribution, especially within agriculture, to inform more responsible practices at the local and international level.

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