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**Access to Water and Sanitation in Atlantic Nicaragua**

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**Access to Water and Sanitation in Atlantic Nicaragua**

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## **Abstract**

### **Access to Water and Sanitation in Atlantic Nicaragua**

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Afro-descendant communities in Central America have recently made important legal strides by enshrining their right to equal treatment under the law and in some cases their ability to claim a distinct group status in national constitutions. The United Nations recently issued a draft resolution declaring that access to water and sanitation is a universal right, furthering the tools available to marginalized afro-descendant peoples in their battles against poverty and underdevelopment. Unfortunately, implementation of these measures has been slow in some areas and non-existent in others. Though there have been some advances, the situation for Afro-descendant communities remains largely unchanged and the availability of the basic requirements of life for Afro-descendant populations remains among the lowest in the region. Increased attention to the political, social, and especially the material situation of Afro-descendant communities is needed in political circles, as well as in the academic community.

There is a lack of scholarly work on the material well-being of Afro-descendent populations in Central America. An important initial contribution in this area would be the compilation, and accumulation of statistical information as a primary step in

developing the literature. The focus of this study then is on the Atlantic Coast Afro-descendant populations in Nicaragua. This document will outline the current material circumstances of Nicaraguan Afro-descendant communities using data gathered from a variety of sources, identify the causes of inadequate access to water and sanitation, and suggest strategies to improve the situation of these communities. It is my sincere hope that, at the very least, increased attention will be brought to the situation.

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## INTRODUCTION

Despite growing international focus on renewable energy and environmental sustainability, a sizable portion of the world's population remains without access to the basic resources needed to build sustainable communities. Clean, drinkable water and hygienic sanitation systems are an integral part of building communities that are able to provide a solid base for economic wellbeing and sustainable development. Access to these systems has paradoxically become less available in many areas even as worldwide technological structures continue to advance. This study seeks to understand and identify the elements of this paradox in the Afro-descendant population of the city of Bluefields, Nicaragua as a means to in the process of mitigation. Water and sanitation are by no means the only important factors to consider in the effort to create sustainable development for places like Bluefields. Access to adequate medical facilities, vaccinations, adequate infrastructure, loans, and other important social services should also be considered when determining a community's ability to establish a regime of material well-being and economic sustainability. Nevertheless, potable water and sanitation are key aspects of community well-being and principle components of sustainable development.

Solving the problem of inadequate basic resources and infrastructure is a sizable task that communities like Bluefields cannot hope to accomplish by themselves. Active participation by engaged scholars in creating the knowledge base necessary for rational intervention in these problems is of dire importance if any progress is to be made. International political pressure, which can be spearheaded by scholars, is also necessary in order to force national governments into action. The existence of recently enacted legal measures in Central American countries, like Nicaragua, that declare the equality of

marginalized communities provide legitimacy for states with less than stellar histories of inclusion are important. However, in practice, these measures are insufficient to truly bridge the gap in opportunities and living standards between well-to-do majority populations and marginalized Afro-descendant communities.

## Water

Water is a colorless, odorless, and flavorless compound. It is also a universal solvent because of its unique ability to carry other minerals by dissolving them into its mass. Water is the only natural substance that exists in all three states; liquid, solid, and gas. About 70 percent of the earth is covered in water, mostly in the form of oceans, but only 3 percent of the Earth is covered in fresh water. In addition, almost 70 percent of fresh water supplies are currently trapped in icecaps and glaciers.<sup>1</sup> Figure 1 below shows the breakdown of Earth's water supplies. The scarcity of fresh water resources causes problems for populations who are in need of drinking water and clean water for sanitation. Often populations in developing countries, like Nicaragua, turn to expensive desalination procedures in order to turn ocean water drinkable. These procedures constrain budgets and delay important investments in infrastructure, leaving populations vulnerable to water shortage and pollution.

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<sup>1</sup> USGS, "Water Science," *The Hydrologic Cycle*, USGS pamphlet, 1984, n.d., <http://ga.water.usgs.gov/edu/earthhowmuch.html>, (accessed April 11, 2011).

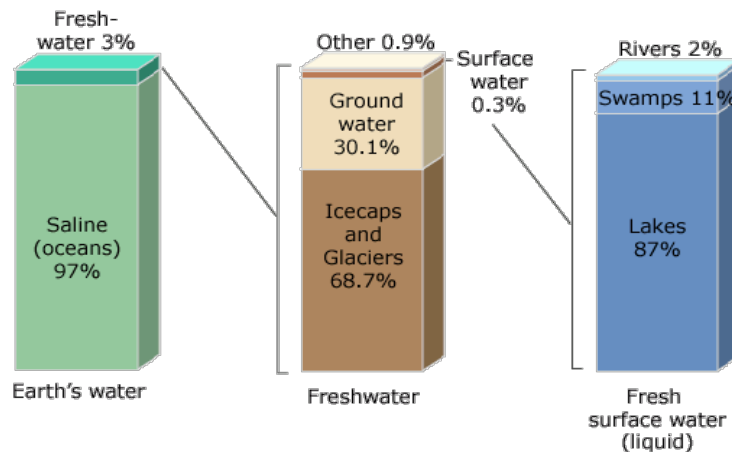


Figure 1 – Distribution of Earth's Water<sup>2</sup>

According to the World Water Council in 2004, 77 million Latin Americans lacked access to clean water including 51 million rural and 26 million urban residents. In addition, 100 million people lacked access to any sort of sanitation in the region. Moreover, 256 million people depended on just latrines and septic tanks in 2000. In total just 49 percent of the total population of Latin American received sanitation services.<sup>3</sup> The council also recognized a severe lack of treatment of sanitation waste, evidenced by less than 14 percent of houses with access to sewage treated by sanitation plants. Water pricing inequality is also a problem evidenced by 1.5 to 2.8 times higher prices for poor consumers than wealthier consumers. The council also found that these consumers receive lower quality water creating comparatively higher health problems in these consumers. Pollution of aquifers by mining and agricultural activities has limited the available amount of water in Latin America.<sup>4</sup> The statistics gathered by the council and the problems they identified show the seriousness of the situation. However, while the

<sup>2</sup> USGS, "The Water Cycle", n.d., <http://ga.water.usgs.gov/edu/watercyclehi.html>, (accessed April 11, 2011).

<sup>3</sup> World Water Forum, "Water Problems in Latin America."

<sup>4</sup> Ibid.

situation is dire for Latin Americans in general, information is needed about how effectively traditionally marginalized groups, like Afro-descendants, are able to attain clean water resources for drinking and sanitation.

Nicaragua has access to large amounts of water, however fresh drinking water is not plentiful as pollution problems limit the use of water from many sites that are within easy access to major population centers. The amount of available water in Nicaragua is roughly equivalent to 5 times the average amount of available water in every other Central American country.<sup>5</sup> Nicaragua is also home to the 19th largest lake in the world, Lake Nicaragua. More than 35,000 cubic meters of water per capita per year are available per citizen in Nicaragua and 15 percent of the entire country is covered in water. Yet less than 1 percent of available water resources are actively used. The RAAS (*Region Autonoma del Atlantic Sur*)<sup>6</sup>, the department Bluefields is located, receives more than 200 inches of rainfall per year creating puzzling water scarcity in the face of abundant natural resources.<sup>7</sup> Clearly there is plenty of naturally occurring water in Nicaragua. Water problems stem from economic, social, and political processes in the country's past. These processes have created distinct dilemmas for policy makers concerned with social justice in the region.

There are generally two problems that affect fresh water extraction in Nicaragua: pollution and insufficient technology. Pollution from industrial waste, residential waste, and other activities contaminate available water resources. Unpolluted sources of water are generally inaccessible to Nicaraguan water companies, which generally lack the financial resources and technological ability to access them. These factors have been

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<sup>5</sup> USGS, "Water Science."

<sup>6</sup> South Atlantic Autonomous Region

<sup>7</sup> World Water Forum, "Water Problems in Latin America" (World Water Council, February 3, 2004).

compounded over many years cumulating with the current situation faced by residents of Nicaragua's many regions where dangers from water pollution are confronted daily. Stakeholders in Nicaragua have not distributed hardships from water problems evenly among their regions and populations. Generally Pacific Coast populations have access to clean water from potable systems that populations on the Atlantic Coast have not.

Water's ability to act as a universal solvent can cause hazardous materials to get collected into water samples.<sup>8</sup> Microorganisms and minerals like iron that become trapped and are transported into the human body where they can become poisonous. Ingesting contaminated water may cause cholera, dysentery, diarrhea, or typhoid. While the ability of populations to gain access to water is important, it is ultimately just as important that this water be clean. Table 1 illustrates the impact of unclean water compared to other causes of death worldwide. Normal adults should drink between one and a half liters and three liters of water per day in order to replenish the almost 70% of our body that is made up of water.<sup>9</sup> Children require slightly less water, but active children can consume as much water as a grown adult. Lack of access to clean water affects all stakeholders and has the ability to stall an economy.<sup>10</sup> Agriculture and industrial processes also require clean water to perform economic activities like growing produce and creating consumer products.

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<sup>8</sup> World Water Forum, "Water Problems in Latin America."

<sup>9</sup> ENACAL, "ABC Sobre El Recurso Agua y Su Situacion en Nicaragua" (ENACAL Managua, December 2007).

<sup>10</sup> Ibid.

<b>Cause of Death</b>	<b>Impact</b>
<b>Tobacco</b>	8 million deaths per year
<b>Unclean Water</b>	<b>8 million deaths per year</b>
<b>Food Shortages</b>	6 million deaths per year
<b>AIDS</b>	3 million deaths per year
<b>Tuberculosis</b>	2 million deaths per year
<b>Armed Conflict</b>	500,000 deaths per year

Table 1 - Worldwide Causes of Death<sup>11</sup>

Afro-descendant populations in Central America engage in activities and live in areas where access to clean water and sanitation are important cornerstones for their ability to sustain themselves. Afro-descendants in Nicaragua traditionally work in occupations like farming, fishing, and food services; as a result, water is of the utmost importance to their health and way of life. If there are no clean sources of water for these populations then irreparable harm will be done to their ability to survive and future sustainability will be unreachable. Afro-descendant populations also face unique challenges with regard to potable water because of socioeconomic factors. Low-income Afro-descendant urban populations cannot afford the time necessary to seek out sources of water, are unable to afford retail sources of water, and often must resort to contaminated sources. These contaminated sources affect their ability to work and make wages, which further impedes their ability to obtain water in the future. The result is a cycle where populations without clean water supplies are left on their own to seek potable water, resort to unclean sources, get sick, earn less money, and are therefore remain unable to afford clean water in the future. Afro-descendant population's unique position in Nicaraguan society places them at particular risk, as there are limited sources of clean

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<sup>11</sup> Ibid.



water available to them. This causes additional externalities that don't exist when other, more visible populations are considered.

### WATER IN BLUEFIELDS

Bluefields is a coastal city located on the Bluefields Bay, which is blocked by a strip of land to the east from full incorporation into the Atlantic Ocean. Water is a staple of the lives of residents and features prominently into the economy of the coast. Clean water for drinking and sanitation is lacking due largely to inadequate infrastructure and salinity from the Atlantic Ocean. ENACAL (*Empresa Nicaraguense de Acueductos y Alcantarillados*)<sup>12</sup> summarizes the situation in Bluefields in the following quote from a report on water in 2007,

*“Equipped with large rivers that cross it, such as: El Escondido, Grande de Matagalpa, Kurinwás, Mico, Punta Gorda and Siqui,. Bluefields should not have problems with the use of water for human use. **However the problem is that the fresh surface water is scarce, affected by salinity or absent in coastal wetlands, estuaries, lagoons, swamps and mangroves.**”*<sup>13</sup>

Bluefields does not have a citywide system for potable water distribution or sewage. The city's wastewater and sewage is not collected nor in any way managed and or treated. Trash and other waste is dumped into unofficial landfills and not treated. Brown and black waters can be seen around the city and all water, regardless of the

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<sup>12</sup> Nicaraguan Company of Aqueducts and Sewage

<sup>13</sup> ENACAL, “ABC Sobre El Recurso Agua y Su Situacion en Nicaragua.”

source, must be treated before consumption.<sup>14</sup> The lack of infrastructure in Bluefield's leads to questions about the effectiveness of the Nicaraguan government's ability to provide clean water sources for the Atlantic Coast.

Institutionally, Nicaragua does not have a comprehensive water law on its books. Several drafts have floated around the National Assembly but at this moment nothing has been passed into law.<sup>15</sup> As a result, water management is the responsibility of a number of institutions and committees. The Ministry of the Environment and Resources (MARENA) monitors water quality and protects ground water reserves. The Ministry of Development, Industry and Trade (MIFIC) is tasked with distributing permits for water use. The Nicaraguan Institute of Water and Sewage (INAA) is the public regulator of water. ENACAL (Nicaraguan Company for Water and Sewage) is the Governmental agency charged with supervision of water quality and sewage. The Division of Water Resources (INETER) provides flood assistance and monitors water levels. The Social Investment Fund of Nicaragua builds water projects in rural communities. CONAPAS, a water commission, is responsible for keeping track of at large water issues in the country.<sup>16</sup> With so many ministries tasked with responsibilities that pertain to water how has Bluefields gotten to this point? If it is the job of these ministries to provide clean water and sanitation services then how can Bluefields lack basic infrastructure? The answers to these questions can be found in the deep historical differences between the two coasts and the historical treatment of Nicaraguan Afro-descendants.

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<sup>14</sup> Alma Rosa Castro, "The State of Water and Sanitation, RAAS, 2007", 2007.

<sup>15</sup> ENACAL, "ABC Sobre El Recurso Agua y Su Situacion en Nicaragua."

<sup>16</sup> Ibid.

## Afro-descendants in Nicaragua

Afro-descendants have significant populations in almost all countries in Latin America. Total Afro-descendant populations in Latin America are modestly estimated at 150 million representing 30 percent of the entire population of the region.<sup>17</sup> Figure 1 below shows the percentage of Afro-descendants in the region by country. In Brazil officially 40 percent of the population is Afro-decedent with estimates as high as 100 million persons (and as low as 65 million) that can claim black ancestry, making it the largest Afro-descendant country in the world (Nigeria is the highest). Over half of the poor in Brazil are Afro-descendant, a shocking number.<sup>18</sup> Columbia also has a substantial afro-descendant population estimated officially at around 4 million people, with estimates as high as 10 million.<sup>19</sup> Peru, Ecuador, and Venezuela combine for another 8 million. Central American countries combine for a modest estimate of 5 million Afro-descendants in the region.<sup>20</sup> The numbers of Afro-descendants in Latin America are staggering and are a tremendous testament to the scope of the slave trade in the Americas (see figure 2). However, the perception outside of academic circles is far from this reality. Many people, including official state representatives, maintain that Afro-descendant populations are non-existent and that national populations are a result of “mestizaje” between indigenous and European peoples. In addition, racial discrimination against people of African descent has resulted in huge incentives for Afro-descendant populations to deny their

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<sup>17</sup> Minority Rights Group International, “Minority Rights Group International : Brazil : Afro-Brazilians,” *World Directory of Minorities*, n.d., <http://www.minorityrights.org/?lid=5285&tmpl=printpage>, (accessed November 29, 2010).

<sup>18</sup> Rapaport Center for Human Rights and Justice, “Unfulfilled Promises and Persistent Obstacles to the Realization of the Rights of Afro-Colombians,” 2007.

<sup>19</sup> Inter-American Consultation on Race in Latin America, “Inter-American Dialogue Race Report”, January 2003.

<sup>20</sup> William V. Davidson, “The Garifuna of Pearl Lagoon: Ethnohistory of an Afro-American Enclave in Nicaragua,” *Ethnohistory* 27, no. 1 (Winter 1980): 31-47.

African roots. Regardless of the discourse, Afro-descendant populations exist in Latin America, and Nicaragua is no exception.



Source: Statistical data provided by Inter-American Dialogue Race Report, January 2003. Map Resources. Adapted by CRS. (K. Yancey 10/18/04).

Figure 2 - Afro-descendants as a Percentage of Total Country Population

Nicaraguan Afro-descendant populations in Nicaragua fall into two distinct groups, Garifuna and Creole. Garifunas are the descendants of indigenous (Carib) and African populations exiled from British possessions in the Caribbean. They were known to the British as “Black Caribs” to separate the population from other Caribbean groups. The Garifuna have traditionally lived on the Atlantic Coast, mostly within a few miles of

the Atlantic Ocean. Some Garifuna speak Garifuna, but some also speak Creole English and Spanish.<sup>21</sup> Today there are approximately 1,095 Garifuna in the RAAS<sup>22</sup> according to the 2005 Nicaraguan census,<sup>23</sup> while estimates of the total population of Garifuna in Nicaragua are much more difficult to calculate. Creoles, on the other hand, are the descendants of indigenous, African, and British populations. Although the history of this group has been debated<sup>24</sup>, they account for the largest Afro-descendant group in Nicaragua.<sup>25</sup> There are approximately 16,607<sup>26</sup> creoles in the RAAS, according to the 2005 census, most living in Bluefields.<sup>27</sup> Creoles speak Creole English, and Spanish. Creoles and Garifuna both engage in economic activities like fishing, farming, and food service. They have performed these economic roles throughout their history and depend on them for their income and sustenance. Water quality and scarcity issues are affecting these groups way of life. These Atlantic Coast Afro-descendant populations have created a very different history on the Atlantic Coast of Nicaragua, as opposed to the Pacific Coast, a history that has created tensions within and marginalization from the center of Nicaraguan politics in *Managua*.

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<sup>21</sup> Edmund Gordon and Mark Anderson, "The African Diaspora: Toward an Ethnography of Diasporic Identification," *The Journal of American Folklore* 112, no. 448 (1999): 282-296.

<sup>22</sup> RAAS will be discussed further later in the document.

<sup>23</sup> INIDE, "VIII Censo de Poblacion y IV de Vivienda" (El Instituto Nacional de Información de Desarrollo, 2005).

<sup>24</sup> Gordon and Anderson, "The African Diaspora: Toward an Ethnography of Diasporic Identification."

<sup>25</sup> Ibid.n."

<sup>26</sup> Estimates of Afro-descendant numbers in Bluefields are generally inaccurate and unreliable.

<sup>27</sup> INIDE, "VIII Censo de Poblacion y IV de Vivienda."

## Nicaragua – A Brief History

Nicaraguan history is a complex history of oppression and subjugation; first at the hands of the two greatest colonial powers in history and then at the hands of the United States. Nicaraguan history begins in 1522, when the first Spanish expedition headed by *Gil Gonzales Davila* landed on the shores of Nicaragua. What ensued is a mirror of the conquest in rest of the Americas.<sup>28</sup> Slavery, death by disease, and death by the sword decimated indigenous populations, which shrunk in number from one million to an official census record of 11,137 at the hands of the Spanish Empire.<sup>29</sup> The Spanish had little interest in the Eastern or Atlantic half of Nicaragua. They settled in the Western half and built cities like Leon and Granada, while allowing the Atlantic Coast to autonomously handle their own affairs. This arrangement continued until the 1655 when the British took control of the Atlantic Coast and made a number of attempts to take over the western portion of the country. Having failed in this endeavor, the British established the “Miskito Kingdom” in 1687, effectively creating a British protectorate on the Atlantic Coast.<sup>30</sup> Since this moment a divide has separated the country physically and also culturally, socially, linguistically, and politically.

In 1838, Nicaragua gained its independence from Spain. In 1860 the British officially renounced its right to govern the Miskito Kingdom in the treaty of Managua. The kingdom was incorporated into the new republic but residents of the region were not required to pay taxes and were to have full rights to all resources on the Atlantic Coast. This arrangement served as the first autonomous model for Nicaragua. Despite the arrangement, extraction of coast resources was a key feature of successive regimes,

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<sup>28</sup> Teresa Meade, *A Modern History of Latin America: 1800 to the Present* (Wiley-Blackwell, 2007).

<sup>29</sup> Encarta Online, “Nicaragua”, n.d.

<sup>30</sup> Ibid.

particularly the Somoza regime. Unfortunately, even more liberal regimes, like the one established during the Sandinista Revolution, proved to be detrimental to Coast politics and resources.<sup>31</sup>

The Sandinista Revolution removed the Somoza dynasty from power in 1989, promising changes in power relations between various groups of society.<sup>3233</sup> This did not, however, stop the Atlantic Coast from experiencing subjugation from the western center of Managua. What resources, if any, could be farmed, mined, or extracted were determined by the new government. The Central government also set prices on goods and Coast populations were forced to sell commodities at a predetermined price. Social unrest followed, and public protests in cities like Bluefields eventually led to the adoption of the 1987 Autonomy Law.<sup>34</sup> The law states that

*“Nicaragua is a multi-ethnic nation (Art. 8) and recognizes the right of the Atlantic Coast communities to preserve their cultural identity, their languages, art and culture, as well as the right to use and enjoy the waters, forests and communal lands for their own benefit. It also recognizes their rights to the creation of special programmes designed to contribute to their development (Art. 89 and 90), while respecting their right to live and*

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<sup>31</sup> Interamericana, “A Brief History of Autonomy | Interamericana”, July 13, 2010, <http://interamericana.co.uk/2010/07/a-brief-history-of-autonomy/>, (accessed November 30, 2010).

<sup>32</sup> *Frente Sandinista de Liberación Nacional*

<sup>33</sup> Frente Sandinista Liberacion Nacional

<sup>34</sup> Interamericana, “A Brief History of Autonomy | Interamericana.”

*organize themselves according to their legitimate cultural and historical traditions (Art. 180). ”<sup>35</sup>*

*“The Autonomous Regions established by the present law are legal entities and as such, in accordance with national policies, plans and guidelines, will have the following general functions: ... **To promote the rational use of the waters, forests, and communal lands for the benefit and enjoyment of their peoples, and the overall preservation of the ecological system.**”<sup>36</sup>*

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<sup>35</sup> World Directory of Minorities, “The Atlantic Coast Autonomy Law (Extracts) - World Directory of Minorities”, n.d., <http://www.faqs.org/minorities/Appendices/The-Atlantic-Coast-Autonomy-Law-Extracts.html>, (accessed November 30, 2010).

<sup>36</sup> Ibid.



## **The Southern Atlantic Autonomous Region**

The Autonomy Law, and other connected legislation, resulted in the creation of two distinct autonomous zones: the RAAN (North Atlantic Autonomous Region) and the RAAS (South Atlantic Autonomous Region), both are pictured below in Figure 3. The capitol of the RAAS is Bluefields, the largest city on the Atlantic Coast. The Southern Region contains twelve municipalities including Bluefields: El Tortugero, Nueva Guinea, Muella de los Bueyes, El Rama, Corn Island, Bocana de Paiwas, Cruz de Rio Grande, Launa de Perlas, Desembocadura de la Cruz de Rio Grande, El Ayote, and Kukra Hill.<sup>37</sup> It also contains the majority of the Afro-descendant population in Nicaragua. The RAAS contains 19 urban *barrios*, or neighborhoods, and 58 rural communities. 82 percent of the population in the RAAS lives in Bluefields; the remaining 18 percent live in the 58 rural communities. More than 2000 people move to the RAAS each year, most to the capitol of Bluefields. This is a serious burden on an already underfunded and overwhelmed infrastructure that has difficulty supplying services to an ever-increasing coast population.<sup>38</sup>

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<sup>37</sup> Encarta Online, "Nicaragua."

<sup>38</sup> Patrick Ramsey, "Bluefields, RAAS, Nicaragua", n.d., <http://www.amigosdenicaragua.org/bluefields.htm>, (accessed December 1, 2010).

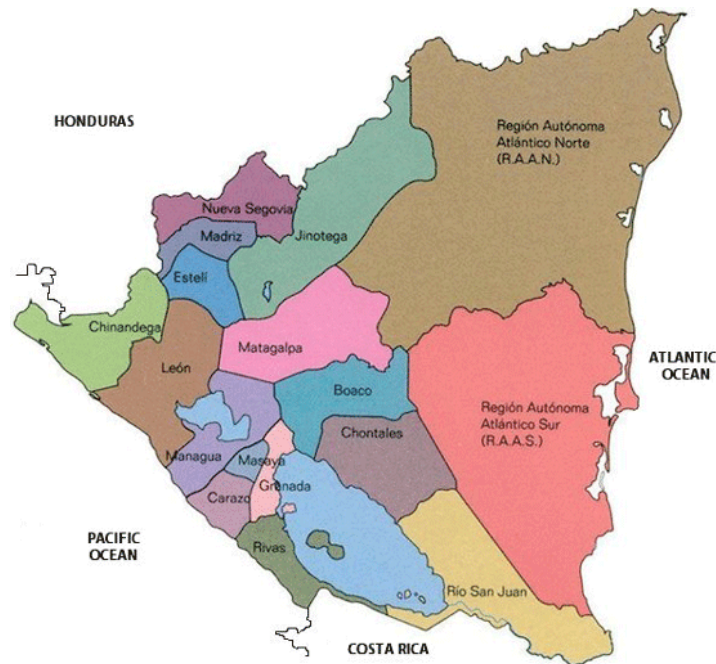


Figure 3 - Map of Nicaraguan Zones/States

Politically the RAAS is run predominantly by Mestizo populations, which have migrated to the area in the post revolution period. As a result, Creoles, Garifuna, and Miskitos are unable to secure political power in areas that have traditionally been theirs. Migration policies undertaken by Nicaraguan administrations have encouraged Mestizo migration to the RAAS from the central and western portions of the country and rural to urban migration. A recent development that firmly illustrates the political tension in the region is the declaration of independence from Nicaragua undertaken by residents of the Northern tip of the Miskito Coast.<sup>39</sup> While the southern region has not yet attempted to move towards something as drastic, the same ambivalence toward Pacific Coast administrations remains.

<sup>39</sup> Tim Rogers, "Mosquito Coast Bites Nicaragua's Ortega - TIME", n.d., <http://www.time.com/time/world/article/0,8599,1894376,00.html>, (accessed December 1, 2010).

## Afro-descendant Rights

Afro-descendants have recently gained many important legal rights from both states and international bodies. The rights afforded to Afro-descendants by the state are a combination of state self-legitimizing strategies and multicultural policy shifts. At any rate, Nicaragua has statutes prohibiting racial discrimination and promoting equality. The statutes have not ended racial discrimination, but have at least provided Afro-descendant communities with a small amount of legal recourse. In addition, collective rights have been granted to Afro-descendant populations in the form of collective property rights to land, and recognition of the multicultural nature of national populations.<sup>40</sup> These collective rights fall under the Law 445, which describes Afro-Nicaraguans as an ethnic community.<sup>41</sup> Nicaragua fairs favorably when compared to other Latin American countries in terms of the depth of the rights afforded to Afro-descendants. In many Latin American countries collective rights, however, have not been afforded equally to indigenous and Afro-descendant groups. In many cases the marginalization of Afro-descendant groups has continued in the form of unequal collective rights that most of the time are contingent on denouncing racial difference and creating cultural difference.<sup>43</sup> The International Labor Organization (ILO) through its Convention 169 on the Rights of Indigenous and Tribal Peoples has served as an important international framework for the

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<sup>40</sup> Afro-descendants are afforded the same rights as indigenous populations in Nicaragua as a result of a “blanket” constitutional statement.

<sup>41</sup> “The set of Afro-Caribbean ancestral families who share the same ethnic conscience for their culture, values, and traditions; tied to their cultural roots and forms of possession of the land and the natural resources.” -- Article. 3, Law of the Regime of Communal Property of the Indigenous Towns and Ethnic Communities of the Independent Regions of the Atlantic Coast of Nicaragua and the Rivers Bocay, Coco, Indio and Maiz.

<sup>42</sup> Jennifer Goett, “PNUD-Informe del Desarrollo Humano de la Costa Atlántica de Nicaragua: Tenencia de las tierras comunales indígenas y afro-descendientes en la RAAS”, December 4, 2004.

<sup>43</sup> Juliet Hooker, “Indigenous Inclusion / Black Exclusion: Race, Ethnicity and Multicultural Citizenship in Latin America,” *Journal of Latin American Studies*, no. 37 (2005): 285-310.

inclusion of Afro-descendant populations. This document along with its predecessors the International Covenants on Human Rights, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social, and Cultural Rights, the International Convention to Eliminate all forms of Racial Discrimination, and the Additional Protocol to the American Convention on Economic, Social and Cultural Rights have created a body of legislation designed to improve the lives of marginalized peoples.<sup>44</sup>

These documents serve an important foundation for Afro-descendant rights and equality but fail to provide Afro-descendants with the ability to secure a sustainable base. They mention access to natural resources, which is extremely important, but never explicitly enumerate rights to clean water or sanitation. Latin American governments, like that of Nicaragua, have responded by ignoring infrastructure development for these populations and creating a system where autonomy is synonymous with abandonment. Water and sanitation are essential building blocks for the preservation of cultures and peoples, but do not get the attention they deserve in Nicaraguan legislative sessions. The Coast is generally considered a region apart from Nicaragua and the people that inhabit the region are treated as secondary members of society. Luckily, new international legislation is attempting to bridge this gap. Recently, the United Nations has voted on a draft resolution containing provisions that will include the right to water as a natural human right.<sup>45</sup> This is a huge step in the legal battle, one that will need an equally forceful practical push. These documents, both national and international, are insufficient

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<sup>44</sup> Alvaro Bello and Marta Rangel, "Equity and exclusion in Latin America and the Caribbean: the case of Indigenous and Afro-descendant peoples," *Cepal Review* (April 2002).

<sup>45</sup> United Nations, "General Assembly Adopts Resolution Recognizing Access to Clean Water, Sanitation as Human Right, by Recorded Vote of 122 in Favour, None against, 41 Abstentions."

to address inequality by themselves but have, nonetheless, have been important victories for Afro-descendant communities.

It is clear racial discrimination has not ended. Rights have been gained by Afro-descendant Nicaraguans, but inequality persists. This study explores one of the causes of historic inequality between Afro-descendants and other populations, inadequate basic services. Services like potable water, which create the backbone of modern sustainable communities, have seen little improvement since the enshrinement of Afro-descendant rights. As a result, the availability of basic services has been heavily affected by persistent social inequalities. Government entities with basic service distribution responsibilities have a responsibility to provide the service equally for all citizens regardless of ethnicity or location. Unfortunately this has not occurred, systematic racism in the distribution of services, caused by the prioritization of some populations over others, has become increasingly evident. This gap is especially visible when Bluefields is compared to other parts of the country. Afro-descendants, who have endured historical marginalization from the Pacific Coast governments of Nicaragua, for example their exclusion from positions of power in government agencies, continue to be marginalized by policy makers who are disconnected from the Atlantic Coast. The prioritization of Pacific Coast populations over Atlantic Coast populations by the Nicaraguan government is systematically racist and creates institutional racism in Nicaragua's most important ministries.

The living conditions of Afro-descendant communities and the future sustainability of Afro-descendant populations are inseparable and directly related. Communities that do not have access to water, or sanitation are communities that cannot focus on the larger picture of competing in an increasingly unforgiving global economy. These communities are not sustainable. Only communities that have access to basic

resources are able of building foundations for sustainable growth. Insufficient resources create opportunity costs associate with the time and effort required to find new sources of basic resources. As a result, low-income communities are affected much more than higher income communities who have enough money to pay to avoid opportunity costs. In practice this means that low-income populations must use time usually devoted to making profit to find new resources and high-income populations can simply buy resources that others cannot afford. Insufficient resources also have negative health affects on populations who become vulnerable to disease. Again, low-income populations cannot afford expensive procedures or time away from moneymaking activities, however higher income populations can. When community's basic needs are met, its residents are free of the burden of continually finding and securing resources. This freedom allows them to pursue productive activities that sustain communities, like creating businesses and inventing products. Without access to the basic necessities of life, sustainability for any community is unattainable.

This study uses a bottom up approach in which the day-to-day lives and perspectives of Afro-Latinos are valued and considered necessary to any research endeavor, which aims to contribute to a larger movement towards equality. This bottom up approach makes this document activist<sup>46</sup> in nature by focusing, not on academic discourse, but on the realities of what it means to be of African descent in one of the poorest regions of the world. This is important because top down strategies have been pursued in Bluefields before. These include: IMF loan programs, World Bank studies, or any number of the visiting scholars who write on the region and tend to make

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<sup>46</sup> See Charles R. Hale, "What is Activist Research" (SSRC, 2001). Activist research refers to a process where the subjects are not subjects at all but active participants in the development and direction of the research.

assumptions and decisions without the input of the people who actually live the realities that these scholars study. By including the experiences of the people who are usually considered “objects” of research from a researcher’s point of view we can better understand the intricacies of the situations that only they live. In essence, activist research believes that the “subjects” themselves are experts and treats them as such. The research and methodology phase of the study sticks closely to this formula and employs a variety of methods to collect data.

## **RESEARCH QUESTION**

How much access to clean water and sanitation is present in Bluefields? How does this affect Afro-descendant populations?



## **METHODOLOGY**

This study employs a variety of techniques in order to try to encapsulate the availability of clean water and sanitation for Afro-descendants in Bluefields. It combines techniques in order to illustrate important historical and empirical points. The history of Bluefields and its relationship with the Pacific coast is important qualitative data that was included. History is an indispensable part of this study because it provides proof of the systemic nature of Bluefield's water problems. It limits the reader's ability to question the validity of claims of racism, spatial or otherwise, while at the same time helping the reader to understand how a situation as complex as this can occur organically. The history of Bluefields and Nicaragua is also important because it helps to establish how the connections between people have traditionally operated in the face of oppression. It is my hope that the brief history provided can serve as a base of understanding between myself and the reader, as well as, further proof of my overarching claims.

Background data is gathered using secondary sources, interviews, surveys, and conversations. Secondary sources are used to provide the background information necessary to understand the size of Afro-descendant populations, their recent struggle for rights and its effects, and the importance of sustainable services to their communities. The literature represents a number of fields including environmental studies, ethnic studies, political science, policy, and geography. The interdisciplinary nature of the literature helps to paint a more complete picture of the current situation and helps the reader to understand the intricacies of the Afro-descendant experience in Atlantic Nicaragua.

Surveys are also used in order to obtain qualitative data in the study. The qualitative component of the surveys ask subjects to comment on the current state of

water and sanitation conditions in their community, as well as if they think that lack of clean water is a real problem. These answers are incorporated into the report to illustrate how individuals on the ground view the situation. In my view this is one of the most important sets of data as it provides many insights into the effects of inadequate services and the mentality of affected communities. In addition to the more practical results of the qualitative research, this report continues to add and build a base of knowledge for affected communities in the Southern Atlantic Autonomous Region of Nicaragua.

I conducted interviews of members of Afro-descendant communities, environmental NGOs, and governmental institutions to gather information on water and sanitation. The researcher's perception, interview questions, and the sources of data are informed by information discovered while working on this document. This is one way that activist research is incorporated into the design of the study. The goal is to not only understand the current state of sustainable services but to also understand the relative level of importance these services have to Afro-descendant communities. After all, if the perceived lack of service in this area is not a problem for local populations, then how can we as researchers insist on its importance?

## LITERATURE REVIEW

There is a vast literature on the relationship between humans and water. Water affects every population in the world. It is the basis of human life and the basis of sustainability making it one of the most important resources in existence. It provides nourishment and life while being consumed. It also provides sanitary technologies like running water, showers, and toilets. Availability of clean water is not only a consumption issue it is also a sanitation issue, although sanitation requires separate infrastructure from simple potable water setups. Water means very different things to different populations, making its importance relative to your ability to secure it for yourself or community. As a human issue, water is beginning to be theorized as a human right, as undeniable as the right to freedom.<sup>47</sup> This is where my thinking for this project begins; with the understanding that water is a human right and that a lack of water is in effect a denial of fundamental human rights.<sup>48</sup>

Access to clean water and sanitation is important because of the effect it has on a community's ability to sustain itself. Communities that lack access to clean water sources find themselves unable to grow sustainably and develop in ways comparable to other populations. However, there is no standard definition of sustainability. Dictionary definitions are limited and do not touch on the multiple ways in which the word is used today. Authors Johnston, Everard, Santillo, and Robert<sup>49</sup> speak to this dynamic in an interesting way. "Reclaiming" definitions of sustainability is an important concept

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<sup>47</sup> United Nations, "General Assembly Adopts Resolution Recognizing Access to Clean Water, Sanitation as Human Right, by Recorded Vote of 122 in Favour, None against, 41 Abstentions."; World Water Forum, "Water Problems in Latin America."; World Health Organization, "Health in the Americas" (WHO, 2007).

<sup>48</sup> United Nations, "General Assembly Adopts Resolution Recognizing Access to Clean Water, Sanitation as Human Right, by Recorded Vote of 122 in Favour, None against, 41 Abstentions."

<sup>49</sup> Paul Johnston et al., "Reclaiming the Definition of Sustainability," *Env Sci Pollut Res* 14, no. 1 (2007): 60-66.

because, as the authors point out, “the word has been co-opted by profit making firms who desire to continue making profits.”<sup>50</sup> Roseland, Brown, Hanson, Liverman, and Merideth<sup>51</sup> speak about the ideal balance between “stable” human populations and healthy environments.<sup>52</sup> The balance between these two entities is paramount in creating true sustainability.<sup>53</sup> Contemporary definitions usually focus on either healthy environments, or increased human consumption.<sup>54</sup> As these authors point out, a level of mediation is required in order to develop effective solutions.

Vieira<sup>55</sup> connects the idea of development with sustainability in a tangible way, one that is also central to an understanding of how to move forward in the future.<sup>56</sup> In his estimation sustainability is only useful if it is tied directly to the development of sustainable designs or systems.<sup>57</sup> In essence, the idea of sustainability, on its own, is novel but not practical. For true sustainability to occur it must be tied to development that incorporates it into its designs.<sup>58</sup>

The Centre for Sustainable Development<sup>59</sup> offers insight into the development of “strong”<sup>60</sup> and “weak”<sup>61</sup> models of sustainable development.<sup>62</sup> The particular insight it

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<sup>50</sup> Ibid.

<sup>51</sup> Mark Roseland, “Sustainable community development: integrating environmental, economic, and social objectives,” *Progress in Planning* 54, no. 2 (2000): 73-132.

<sup>52</sup> Becky Brown et al., “Global Sustainability: Toward Definition,” *Environmental Management* 11, no. 6 (n.d.): 713-719; Roseland, “Sustainable community development: integrating environmental, economic, and social objectives.”

<sup>53</sup> Ibid.

<sup>54</sup> Ibid.

<sup>55</sup> R.K. Vieira, “Designing sustainable developments,” *Solar Today* 4, no. 5 (n.d.): 10-13.

<sup>56</sup> Ibid.

<sup>57</sup> Ibid.

<sup>58</sup> Ibid.

<sup>59</sup> The Centre for Sustainable Development, “Sustainable Development: A review of the International Literature” (University of Westminster, 2006), 23.

<sup>60</sup> “Strong sustainability”, assumes that “non-ecospheric”<sup>60</sup> resources are free game for extraction and eventual depletion. The ecosphere, in this view, is seen as all-important and is valued over the lives of

offers this study is the connection between “weak” models and neo-liberal economic arrangements. Connecting these two concepts helped me to further understand the ways in which the definition of sustainability is subject to political contexts. Generally contemporary sustainable models follow a strategy of weak sustainability. If we understand that western modernity has dictated that “weak” sustainable models are in fact true sustainability, and we want to contest this notion, then we must somehow develop a definition that contests it. My definition of sustainability begins with the understanding that sustainability is primarily about people and community. I reject definitions of sustainability, for example, that are connected to ideas like maximum crop outputs. These I might refer to as a sort of “capitalist ecological” sustainability, where value is placed not on the ability of species to regenerate but only to generate. I also reject definitions of sustainability that ignore future repercussions to the environment (weak sustainability). Some populations have the luxury of waiting for technology to bail them out when they deplete a resource; the most vulnerable populations have no such recourse. What would the price be of a machine that magically produces huge sources of water out of thin air? In this global economy could we expect that vulnerable populations can afford this product or at the very least to have access to it somehow? I also reject definitions of sustainability that focus on the Earth as an entity that should not be touched. In my view

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individual and even groups of people. This is what some development specialists call “the planet over people approach.” - Ibid.

<sup>61</sup> “Weak sustainability”, postulates that technology can serve as a substitute for natural resources. This view allows resources to be completely depleted with the expectation that in the future technological advances will recreate them. This view is called the “willingness to pay approach” or the “have your cake and eat it doctrine” by some development specialists. This approach has become increasingly propagated in contemporary sustainability literature. It has come to dominate practical sustainability work. While the theory of weak sustainability may work well within current dominant economic politics, it has failed to produce practical results for large portions of the world’s population and in fact has contributed to the rapid degradation of both the global environment and resources.- Ibid.

<sup>62</sup> The Centre for Sustainable Development, “Sustainable Development: A review of the International Literature.”

the Earth is here to aid in the development of our species. The Earth should not be abused, but it also shouldn't be allowed to sit untouched while real people die. As the Institute for Environmental Studies paper, "Global Sustainability", points out, there are an unending amount of definitions for the concept of sustainability.<sup>63</sup> I will only attempt to offer one definition.

The most elegant definition of sustainability finds its origins in the 1987 World Commission on Environment and Development at the United Nation's Brundtland Report.<sup>64</sup> In this report sustainability was defined simply as "development that meet(s) present needs without compromising the ability of future generations to meet their needs."<sup>65</sup> Another definition offered by R.K. Vieira states that, "[Sustainability] identifies a concept and attitude in development that looks at a site's natural land, water, and energy resources as integral aspects of the development design."<sup>66</sup> Another definition, not of sustainability but of a related concept, healthy societies, states that a healthy society is "one that to all intents and purposes can be sustained indefinitely while giving optimum satisfaction to its members."<sup>67</sup> I would like to add, with an emphasis, "[ALL] of its members." From the previous definitions I arrive at my own operational definition of sustainability and sustainable development.

*"Development that meets present needs, without compromising the ability of future generations to meet their needs, while simultaneously integrating resources, like land,*

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<sup>63</sup> Brown et al., "Global Sustainability: Toward Definition."

<sup>64</sup> United Nations, "A/RES/42/187 Report of the World Commission on Environment and Development", 1987, <http://www.un.org/documents/ga/res/42/ares42-187.htm>, (accessed May 1, 2011).

<sup>65</sup> Johnston et al., "Reclaiming the Definition of Sustainability."

<sup>66</sup> Vieira, "Designing sustainable developments."

<sup>67</sup> Brown et al., "Global Sustainability: Toward Definition."

*water, and energy, into development designs paying close attention to the optimal satisfaction of all the members of society.*“

Another concept that is central to the arguments presented in this paper is the idea of community. Communities are created around social ties between people. In this study some of the ties that create community are ethnic ties, relationships to water, and relationships to the state. People that interact in similar ways within these concepts create a community, consciously or not. Community seems to be a relatively simple concept, but lost in its simplicity are the various layers that help communities function. Capra offers a connection between the natural sciences and the social sciences.<sup>68</sup> Capra compares the many ways in which people are connected to individual cells in our bodies.<sup>69</sup> Roseland introduces the notion of social capital and natural capital.<sup>70</sup> Social capital is, in effect, the community itself and points to the fact that communities are based around social interactions.<sup>71</sup> The aggregation of these social interactions is what comes to define what we typically view as a community.<sup>72</sup>

Fritjof Capra, in his book, “The Hidden Connections: A Science of Sustainable Living”, asserts, “living networks continually create, or re-create, themselves by transforming or replacing their components. In this way they undergo continual structural changes while preserving their web like patterns of organization.”<sup>73</sup> This definition fits firmly within our sustainable context and illustrates the idea that structural changes, and in this case changes of the overall economic system, should preserve the connections

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<sup>68</sup> Fritjof Capra, *The Hidden Connections: A Science for Sustainable Living* (Harper Collins, 2004).

<sup>69</sup> Ibid.

<sup>70</sup> Roseland, “Sustainable community development: integrating environmental, economic, and social objectives.”

<sup>71</sup> Ibid.

<sup>72</sup> Ibid.

<sup>73</sup> Capra, *The Hidden Connections: A Science for Sustainable Living*.

among people.<sup>74</sup> Developments that challenge these connections threaten communities and displace the connections between people.<sup>75</sup> This results in something that M.K. Canales calls “othering”.<sup>76</sup> “Othering” is, in effect, exclusion.<sup>77</sup> Another version of community, put forth by health policy specialists, states that, “[community is] a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings.”<sup>78</sup> This means that a community is an aggregation of ideas, or connectedness.<sup>79</sup> It is also both a local and global phenomenon.<sup>80</sup> Friedland<sup>81</sup> connects communities to democratic action. Democracy is commonly seen as a result of human interactions rather than the basis of human interaction.<sup>82</sup> The act of aggregating ideas, and links between people is intrinsically democratic.<sup>83</sup> So much so that community itself is inseparable from the idea of democracy.<sup>84</sup> To be communal, is then to be democratic. The following is my operational definition of community, which I believe integrates well with my operational definition of sustainability. Communities are:

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<sup>74</sup> Ibid.

<sup>75</sup> Ibid.

<sup>76</sup> M.K. Canales, “Othering: Toward an Understanding of Difference” 22 (n.d.), [http://journals.lww.com/advancesinnursingscience/Fulltext/2000/06000/Othering\\_\\_Toward\\_an\\_Understanding\\_of\\_Difference.3.aspx](http://journals.lww.com/advancesinnursingscience/Fulltext/2000/06000/Othering__Toward_an_Understanding_of_Difference.3.aspx).

<sup>77</sup> Ibid.

<sup>78</sup> Lawrence Green, “Can Public Health Researchers and Agencies Reconcile the Push From Funding Bodies and the Pull From Communities?,” *Community-Based Participatory Research* 91, no. 12 (December 2001).

<sup>79</sup> Ibid.

<sup>80</sup> Ibid.

<sup>81</sup> Lewis Friedland, “Communication, Community, and Democracy,” *Communication Research* 28, no. 4 (2001): 358 -391.

<sup>82</sup> Ibid.

<sup>83</sup> Ibid.

<sup>84</sup> Ibid.



*“Living networks that continually create, or re-create, themselves, by transforming, or replacing, their components, undergoing continual structural changes while preserving their web like patterns of organization -- which are diverse links created by social ties, common perspectives, and joint actions in geographical, ideological, mutual, and intrinsically democratic settings.”*

Afro-descendant issues and rights are frequently written and theorized about in Latin America. Sources specific to Nicaraguan Afro-descendants are rare but some literature exists on the topic. Marx<sup>85</sup> contributes by discussing the ways in which states have tried to build their nation. Typically nation building occurs at the expense of an out-group who is used as a political opponent in order to create solidarity within groups with low group identification. The practical result of which is a marginalization and isolation. Marx also discusses the absence of formal segregation in Latin America and the effects of this absence. “Mestizaje” and its interaction with nations as they attempt to build is the key contribution of Marx. Evans<sup>86</sup> adds that the most significant challenge for Afro-descendants as they attempt to develop is states that deny that race is a problem. These states do not attempt to track institutionalized racism and do not recognize unique factors of certain groups. Centeno<sup>87</sup> theorizes about other challenges faced by Afro-descendants in multicultural states. The major challenge for these populations is the attempting to find the most effective solution to make claims to the state. Centeno notes that this is particularly hard when many states do not guarantee access to basic resources. Afro-

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<sup>85</sup> Anthony Marx, *Making Race and Nation: A Comparison of the United States, South Africa, and Brazil* (Cambridge, UK: University of Cambridge Press, 1998).

<sup>86</sup> Peter Evans, “The Eclipse of the State? Reflections on Stateness in an Era of Globalization.,” *World Politics* 50, no. 1 (n.d.): 61-87.

<sup>87</sup> M.A. Centeno, *Black and Debt: War and the Nation-State in Latin America* (University Park: Pennsylvania State University Press, 2002).

descendants, and their relationship with the state, is at the center of this study and many of the contemporary debates in the region.

Afro-descendant right have only recently been enshrined in many Latin American countries but constitute an important base for future action. International laws and their implications are touched on by the Rappaport Center at the University of Texas<sup>88</sup> in a string of documents aimed at highlighting Afro-descendant struggles in the region. Bello and Rangel<sup>89</sup> contribute a discussion about how exclusion has continued to occur even after the passing of equality legislation. Afro-descendant rights have not been implemented in many locations, these authors point this out and explain the paradox. Hooker<sup>90</sup> expands on how Afro-descendant rights struggles have operated differently than indigenous rights struggles. These differences are created by the existence of legislation that requires ethnic claims for redress, which indigenous populations can claim. Afro-descendants, who are recognized as a racial group in Nicaragua, are therefor handicapped when making these claims. Afro-descendant right have only recently been established in Latin America but scholars have successfully theorized the constraints of such a system.

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<sup>88</sup> Rapaport Center for Human Rights and Justice, "Unfulfilled Promises and Persistent Obstacles to the Realization of the Rights of Afro-Colombians."

<sup>89</sup> Bello and Rangel, "Equity and exclusion in Latin America and the Caribbean: the case of Indigenous and Afro-descendant peoples."

<sup>90</sup> Juliet Hooker, "Afro-descendant Struggles for Collective Rights in Latin America: Between Race and Culture," *Souls* (2008): 279-291.

## **SCOPE**

The scope of this project has been limited by a number of factors. Time has proved to be the most prohibiting factor by affecting every stage of the process. The data collection process could not possibly hope to approach my own hopes for its thoroughness in the short time that I was able to visit Nicaragua. However, the data collected still reveals several important pieces of information for this project and helps to answer my stated research question. Scheduling interviews, finding subjects for interviews and transpiration restraints on my ability to move efficiently ate considerably into the already short time I had allotted to finish this research. Responsibilities at work restricted my ability to be in Nicaragua and also restricted my ability to make subsequent trips back. Time has also affected aspects of the historical background for this project. My inability to travel to Managua, Nicaragua's capital city, for any meaningful length of time has certainly affected my ability to obtain documents, governmental or otherwise, which may have aided me. Funds have also constrained my research in Nicaragua. Personal funds were used for the short trip I made during Spring 2011, and it would have been very difficult for me to find further funds and secure more time off from my job. Several sites of interest in Nicaragua in and around Bluefields proved too financially prohibitive for me to attempt to visit. The result of this limitation is a focus on Bluefields as opposed to villages in the R.A.A.S. It is my hope that someday I can return to the topic with a more expansive scope and spend additional time exploring water issues in Nicaragua.

## DATA COLLECTION AND ANALYSIS

Bluefield's growth over the past decade has expanded the city and its population. The city itself is home to many diverse groups. Creole, Miskito, indigenous and Spanish residents all live inside the city limits and the autonomous region. Some sources estimate that Bluefields grows by 2,000 people a year.<sup>91</sup> Population growth that low might not seem like much of an issue for policy makers but infrastructure in Bluefields, in many cases, has never been developed. Adding increased populations to a system already over its carrying capacity creates additional strains on the system and simply compounds the problem.

The Nicaraguan Government, however, has done a decent job in recent years of attempting to connect the city to the outside world. Roads to *Managua*, personal telephone, and DSL internet hookups have been constructed during this period. Electricity is available over almost the entire city and hookups only require purchasing a meter. As a result of these investments, Bluefields infrastructure has gone through continuous upgrades resulting in living conditions that are very good for some. However uneven infrastructure development and, in some place, nonexistent development have left large portions of the city without access to infrastructure. Funding continues to be an issue in Bluefields as the budget for government water and sanitation operations in the city fall woefully short of what the population requires.<sup>92</sup> There are also questions about the quality of services, water included, which leads many residents to look for multiple solutions to their lack of infrastructure.

The map below shows the city of Bluefield's neighborhoods and the main roads, which divide the town. I resided in the eastern strip of the neighborhood of *Punta Fria*

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<sup>91</sup> Ramsey, "Bluefields, RAAS, Nicaragua."

<sup>92</sup> Interview CITE

close to Central during my time in Bluefields (see figure 4). This neighborhood has access to potable water provided by the city, bottled water from the very close market, and well water from contaminated aquifers. *Punta Fria* is one of the only neighborhoods with access this easy and readily available. However, water quality from even this limited service proved to be an issue during my stay and availability was also spotty at times. Sanitation was more or less okay in my general area but water pollution and trash were very visible. Aside from my own observations and photos, which accompany descriptions of places or situations, I gathered information from a few other places. Interviews of ENACAL (*Empresa Nicaraguense de Acueductos y Alcantarillados*)<sup>93</sup> officials, the company that supplies potable water, and local residents were key in understanding the water situation in Bluefields. The interviews were given throughout the city of Bluefields and in the city of *El Bluff*. Library visits to BICU (Bluefields Indian and Caribbean University) library, and visits to the desalination plant were also helpful.

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<sup>93</sup> Nicaraguan Company of Water and Sewage

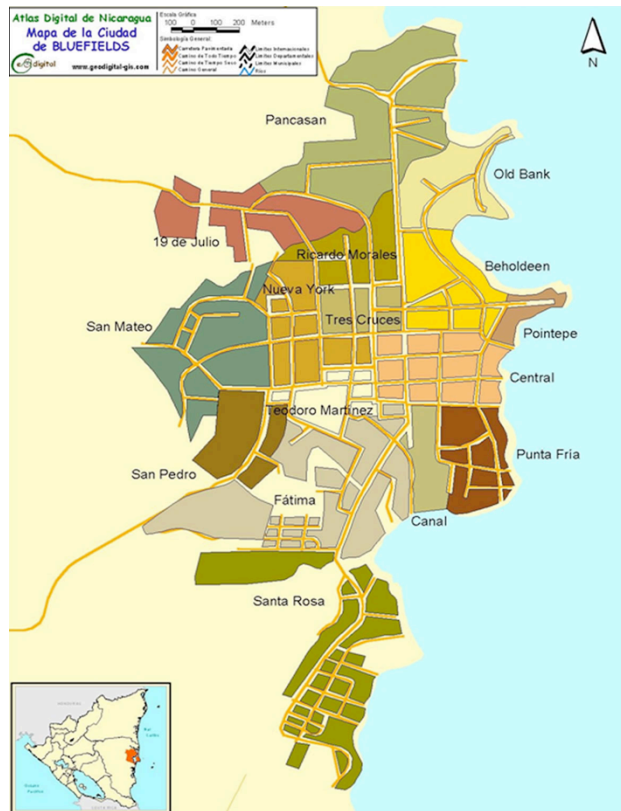


Figure 4 - Map of Bluefields Neighborhoods<sup>9495</sup>

## CURRENT PROJECTS

Bluefield's growth over the last decade has brought with it a few entities that provide clean water and sanitation. Blue Energy, a French NGO, provides wind and solar energy sources for Atlantic communities, in addition to small-scale water solutions. ENACAL, the state owned water company, provides potable water for a small portion of Bluefield's population. Other operations like the water project in the Kukra River use local support to provide local solutions and also help to develop small-scale

<sup>94</sup> "Instituto Nicaragüense de Estudios Territoriales - INETER", n.d., <http://www.ineter.gob.ni/index.php>, (accessed April 11, 2011).

<sup>95</sup> Note: The map mislabels *pointeen* as *pointepe*.

infrastructure. The following section uses these projects to describe the current state of Bluefield's water resources and to illustrate the activities that are currently being employed in attempts to rectify the water situation.

## ENACAL

ENACAL, the Nicaraguan Company of Aqueducts and Sewage, is a Government agency that is responsible for providing clean water and sewage to the citizens of Nicaragua. Its activities are responsible for the potable water and the sewage that is available to residents. ENACAL runs a desalination plant that extracts water from the *Rio Escondido Estuary* and removes salt from it. There are various problems with the desalination plant besides its limited coverage; I will discuss these issues shortly. ENACAL is funded by government finances and, as a result, can be very strapped for money, particularly in areas away from the capital city of *Managua*. Overall, ENACAL represents the government's practical response to problematic water conditions in the country at large. Table 2 shows ENACAL's service numbers across Nicaragua for the year of 2006. Bluefields and the RAAS represent the 2<sup>nd</sup> largest area, and the 7<sup>th</sup> largest population in Nicaragua. Bluefield's potable water production from ENACAL does not proportionally live up to its demographic numbers. Areas like Rivas, which is a tenth of the size and half as populated as Bluefields, produced three times more potable water and had twice as many ENACAL connections. In fact the other cities like Boaco, Carazo, Chontales, Esteli, Granada, Jinotega, Leon, Managua, Masaya, Matagalpa, Nueva and Segovia all outpace the RAAS in potable water production and connections despite having smaller populations and less space.

Area	Population	Size in Km <sub>2</sub>	Potable Water Produced Annually m <sup>3</sup>	2006 ENACAL Connections
<b>Boaco</b>	150,636	4,244	2,628,861	8,581
<b>Carazo</b>	166,073	1,050	11,419,565	25,922
<b>Chinandega</b>	378,970	4,926	16,868,018	39,864
<b>Chontales</b>	153,932	6,378	5,270,756	17,198
<b>Estelí</b>	201,548	2,335	9,295,503	26,597
<b>Granada</b>	168,186	929	12,303,715	21,433
<b>Jinotega</b>	331,335	9,755	2,316,000	9,800
<b>León</b>	355,779	5,107	22,794,952	28,320
<b>Madriz</b>	132,459	1,602	1,997,855	7,797
<b>Managua</b>	1,262,978	3,672	160,495,432	222,847
<b>Masaya</b>	289,988	590	13,087,240	35,611
<b>Matagalpa</b>	469,172	8,523	9,480,000	30,400
<b>Nueva Segovia</b>	208,523	3,123	5,150,317	14,380
<b>Río San Juan</b>	95,596	7,473	531,213	2,047
<b>Rivas</b>	156,283	2,155	6,283,803	14,606
<b>RAAN</b>	314,130	32,159	737,035	3,422
<b>RAAS</b>	306,510	27,407	2,200,223	6,998
<b>Total</b>	<b>5,142,098</b>	<b>121,428</b>	<b>282,860,488</b>	<b>515,823</b>

Table 2 – ENACAL Service Numbers<sup>96</sup>

The following table further illustrates the implications of ENACAL's table of service numbers. The first thing that is immediately noticeable from the graph is that the RAAS is below average across the board. The RAAS averages 7.18 cubic meters of potable water produced annually per person, well below the average and well below places like Carazo, which is half the size and averages 68.76 cubic meters per person. The RAAS's production of potable water annually was only 80.28 cubic meters per

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<sup>96</sup> ENACAL, "ABC Sobre El Recurso Agua y Su Situacion en Nicaragua."



kilometer, which is on par with the Rio San Juan, a population a third of the size of Bluefields (see table 3). Only three locations had values of less than one connection per kilometer, the Rio San Juan, RAAN, and the RAAS. The lack of infrastructure for water connections and a lack of funding for the Atlantic Coast make the area the most under served area of Nicaragua even though the region amount to nearly half of the country's size. The low level of service provided to the Atlantic Coast, across the board, are serious indicators of neglect indifference. Its not coincidental that these areas are historically occupied by Afro-descendant and indigenous populations. The primary problem of water in Nicaragua is funding, but not on the Atlantic Coast.

Area	Potable Water Produced Annually m <sup>3</sup> per person	Potable Water Produced Annually m <sup>3</sup> per Km <sup>2</sup>	Connections per person	Connections per Km <sup>2</sup>
Boaco	17.45	619.43	0.0570	2.02
Carazo	68.76	10875.78	0.1561	24.69
Chinandega	44.51	3424.28	0.1052	8.09
Chontales	34.24	826.40	0.1117	2.70
Estelí	46.12	3980.94	0.1320	11.39
Granada	73.16	13244.04	0.1274	23.07
Jinotega	6.99	237.42	0.0296	1.00
León	64.07	4463.47	0.0796	5.55
Madriz	15.08	1247.10	0.0589	4.87
Managua	127.08	43707.91	0.1764	60.69
Masaya	45.13	22181.76	0.1228	60.36
Matagalpa	20.21	1112.28	0.0648	3.57
Nueva Segovia	24.70	1649.16	0.0690	4.60
Río San Juan	5.56	71.08	0.0214	0.27
Rivas	40.21	2915.92	0.0935	6.78
RAAN	2.35	22.92	0.0109	0.11
RAAS	7.18	80.28	0.0228	0.26
Avg	<b>55.01</b>	<b>2329.45</b>	<b>0.1003</b>	<b>4.25</b>

Table 3 – ENACAL Expanded Service Numbers

The problem of water on the Atlantic Coast is a problem of distribution over racial space. Spaces that inhabit indigenous and Afro-descendant populations, like the RAAS and the RAAN, have not been provided with adequate services for potable water by the Nicaraguan state. Spaces that inhabit *Mestizo* populations have access over and above their needs.

ENACAL's operations in Bluefields are surprisingly simple. There is a desalination plant, and infrastructure in the form of water pipes and connections in urban areas. They have no sewage system at all. Upper management at ENACAL disclosed that only 5 out of 19 barrios are covered by these water pipes and connections. Overall, only 1,420 clients are served by ENACAL<sup>97</sup>, who is tasked with ensuring that Bluefields has access to water. ENACAL's service area amounts to only about 8 percent of the inner-city population,<sup>98</sup> leaving 92 percent of the inner-city population without access to potable water services. ENACAL's service statistics do not include the more than 21,000 other urban residents and 8,000 rural residents in Bluefields, who live in barrios who are not served by ENACAL at all. ENACAL Bluefields can only provide water for a population that is less than the population that Bluefields grows by each year. As migrants continue to come to Bluefields and capacity remains the same, there will inevitably be additional problems with access to clean water and sanitation.

ENACAL revealed that each desalination machine (3) at their plant has a production capacity of 70 cubic meters per hour.<sup>99</sup> ENACAL's own numbers show that only 80 cubic meters were provided per kilometer in 2006. This means that in 2006, only about an hour (1h 9m) of production time from one machine was used per kilometer in the RAAS. If we assume that 70 cubic meters per hour holds true for all the machines that ENACAL uses in Nicaragua then we can make the following calculations illustrated in Table 4 below. Again we see that the three lowest areas, by a lot, are the RAAS, RAAN, and Rio San Juan. All three of these areas receive approximately one hour and a half or less of production per kilometer, and less than six minutes of production time per person.

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<sup>97</sup> "Interview with Carlos Leaba ENACAL," Written, February 13, 2011.

<sup>98</sup> Ibid.

<sup>99</sup> The plant has a maximum output capacity of 210 cubic meters per hour.

Keep in mind that these totals are for the entire year of 2006. When six minutes of production per person is compared to a place like Granada, which receives over an hour per person, we can start to see how institutional inequalities are perpetuated through funding and support. The most obvious discrepancy in the table is the comparison of Managua to the RAAS, which I will return to later.

Area	Potable Water Produced Annually m <sup>3</sup> per person	Potable Water Produced Annually per Km <sup>2</sup>	Hours of Machine Production Used per Km <sup>2</sup>	Hours of Machine Production per person
Boaco	17.45	619.43	8.85	0.25
Carazo	68.76	10875.78	155.37	0.98
Chinandega	44.51	3424.28	48.92	0.64
Chontales	34.24	826.40	11.81	0.49
Estelí	46.12	3980.94	56.87	0.66
Granada	73.16	13244.04	189.20	1.05
Jinotega	6.99	237.42	3.39	0.10
León	64.07	4463.47	63.76	0.92
Madriz	15.08	1247.10	17.82	0.22
Managua	127.08	43707.91	624.40	1.82
Masaya	45.13	22181.76	316.88	0.64
Matagalpa	20.21	1112.28	15.89	0.29
Nueva Segovia	24.70	1649.16	23.56	0.35
Río San Juan	5.56	71.08	1.02	0.08
Rivas	40.21	2915.92	41.66	0.57
RAAN	2.35	22.92	0.33	0.03
RAAS	7.18	80.28	1.15	0.10
<b>Total</b>	<b>55.01</b>	<b>2329.45</b>	<b>33.28</b>	<b>0.79</b>

Table 4 – ENACAL Hours of Machine Production Used

ENACAL's budget deficit of 340,000 (\$17,000) Cordobas per year for their water services in Bluefields is another source of trouble.<sup>100</sup> If 500,000 (\$25,000) Cordobas can only serve 8 percent of the inner-city population, then how much would it cost ENACAL to serve the entire population? The answer is not as straightforward as it seems. Increased funds for ENACAL can mean a lower per person cost subsidized by the increased investment in infrastructure that would occur under this scenario. With more efficient machines, and infrastructure ENACAL can lower per person costs. The question is not about the capabilities of ENACAL, they have provided Managua with a high level of water availability, the question is the budget. However, ENACAL does not have access to this funding for Bluefields and, as a result, the citizens of the RAAS and Bluefields receive inadequate service. ENACAL must secure an increased budget for the future or plan on developing strategies to help civil society to fill the void that the Nicaraguan government cannot.

### **BlueEnergy**

BlueEnergy is a NGO from France that operates in Bluefields and the Atlantic Coast of Nicaragua. It also has units that operate in the United States and internationally. It aims to "improve lives in marginalized communities using a holistic approach to sustainable energy and related fundamental services."<sup>101</sup> BlueEnergy believes in building infrastructure and gaining international support as solutions to the sustainability problems along the coast. BlueEnergy also believes in the development of infrastructure that is designed and specifically desired by the populations that they serve. The organization has

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<sup>100</sup> "Interview with Carlos Leaba ENACAL."

<sup>101</sup> BlueEnergy, "BlueEnergy group," *About Us*, n.d., <http://www.blueenergygroup.org/spip.php?rubrique126&lang=en>, (accessed April 13, 2011).

worked in Bluefields since 2004 and has formed a unique partnership with INATEC (Instituto Nacional Tecnológico)<sup>102</sup> to create a sustainability school named CERCA (Centro Ecologico Regional de Capacitacion Ambiental)<sup>103</sup> This school will work to train people and certify them in designing sustainable systems. The idea is for students to take the knowledge learned back to their communities to assist in the building of much needed infrastructure across Nicaragua. Along with the implementation and administration of CERCA, BlueEnergy also has installed 28 water filters and dug 5 wells in Bluefields and the immediate surrounding area. BlueEnergy is one of the few organizations that are attempting to fix the water problem through a civil society solution by plugging the holes left behind by ENACAL. While their work on water is limited, as they are first and foremost an energy company, they have still made an impact and have helped residents to access water.

### **Other Projects**

The United Nations Development Program (UNDP) is an arm of the United Nations and operates around the world on various development projects. UNDP has an office in Bluefields and does work in and around the Atlantic coast. Their projects do not currently include water or sanitation inside of Bluefields. However they are a source of important information and work in communities along the Atlantic coast.

Additionally, the Ministry of Health distributes chlorine pills to low-income populations that allow residents to “clean” their water. These pills are used by many residents regardless of the source of the water and constitute a cheap means of effective

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<sup>102</sup> **The National Technical Institute**

<sup>103</sup> Regional Ecological Center of Environmental Qualification

sanitation. The Ministry also distributes pills to schools, hospitals, and food establishments. In addition, the Ministry of Health monitors 10 water filters for the city, which are left over from a donation of 1000 from a Global Relief project.<sup>104</sup>

Some communities in and around Bluefields have created their own water systems and manage their day-to-day use. Data on these informal projects are difficult to obtain, but these systems combined with shared wells offer an alternative for water. Rainwater harvesting is also common, but concerns about health outcomes for these systems is high.<sup>105</sup>

## **INFRASTRUCTURE**

Water infrastructure continues to be a problem in Bluefields. ENACAL's water system only covers five neighborhoods in the city.<sup>106</sup> ENACAL's records indicate that only 8 percent of the population in Bluefields is being served.<sup>107</sup> Wells are the predominant means of obtaining water for families and businesses in Bluefields. However, many wells dry up during the dry season and contamination of well water continues to be a huge issue. Without a centralized sewage system, most people use open latrines or cesspools for their sewage, which has lead to a total contamination of the water table. Water pumps are sometimes used (see figure 6), but simple buckets constitute the main means of retrieving water from wells (see figure 5). Some filters are present throughout the city but not in any meaningful number.<sup>108</sup> Bottled water is available at stores throughout the city, and is the only option for some. The reality is that Bluefield's

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<sup>104</sup> Castro, "The State of Water and Sanitation, RAAS, 2007."

<sup>105</sup> Ibid.

<sup>106</sup> "Interview with Carlos Leaba ENACAL."

<sup>107</sup> ENACAL, "ABC Sobre El Recurso Agua y Su Situacion en Nicaragua."

<sup>108</sup> Castro, "The State of Water and Sanitation, RAAS, 2007."

infrastructure is nonexistent. A generous estimate of fifteen percent potable water coverage<sup>109</sup> is extremely low and presents a serious concern for policy makers concerned with social justice.

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<sup>109</sup> After the inclusion of non-ENACAL water systems into our coverage estimate.



Figure 5 – Typical Bluefield's Well used with Bucket



Figure 6 – Typical Bluefields Water Pump



Bluefield's largest water infrastructure project has been the desalination plant (see figure 7). The plant runs its three generators for a maximum output of 210 cubic meters per hour.<sup>110</sup> During my time in Bluefields this plant was not functional because of a lack of funds. ENACAL had run out of money for the month and had simply shut down service for the remainder of the month<sup>111</sup>. The facility itself is impressive. It is modern, efficient and clean. However, the problem is not the quality of the plant, it is the plant itself. The desalination process is expensive, and while it may seem necessary in Bluefields, it is ineffective as the backbone of ENACAL's system. The cost prohibitive nature of desalination means that ENACAL should start seeking other solutions for Bluefield's water problems.

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<sup>110</sup> "Interview with Carlos Leaba ENACAL."

<sup>111</sup> This occurred on the 13<sup>th</sup> day of the month.

Figure 7 – Desalination Plant



Sanitation is also problematic in Bluefields. A drainage system exists for the city but only in central neighborhoods. Where available, drainage waters contain waste from homes as well as water and trash from street level. The city lacks any form of collection

system. In many places wastewater drains into the streets from toilets and kitchens. Latrines and septic tanks are common in houses around Bluefields but lack of regulation causes complete contamination of the water underground (see figure 8). One environmental impact study project in 2003 estimated that 52.4 percent of the population uses latrines, which leech into the water table. Forty-five percent used closed septic systems and 2.5 percent used the bathroom in the open.<sup>112</sup> Garbage collection exists and is carried out throughout the week. Residents place garbage in front of their homes and await collection. This process is said to collect around 53 percent of the city's trash. The remaining residents use the more than eleven informal landfills around the city.<sup>113</sup> Open, stagnate water is prominent in the city. Many times empty lots become home to polluted water puddles and trash. The only service with less infrastructure than that of potable water in Bluefields is the sewage system.

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<sup>112</sup> Castro, "The State of Water and Sanitation, RAAS, 2007."

<sup>113</sup> Ibid.



Figure 8 – Bluefields Outhouse



### **WATER QUALITY ISSUES**

An interview with an ENACAL official revealed that shared wells and informal pipelines have a 98 percent contamination rate with *E. coli*, a deadly bacterial source of gastroenteritis.<sup>114</sup> Regardless of the accuracy of this claim, the contamination rate presents an alarming situation for residents. Most residents do not consume well water without treatment or boiling. Studies or persons that minimize the water problem in Bluefields, because of the proliferation of wells across the city, fail to realize the health risks associated with this practice. Several problems exist in the aquifers under Bluefields. Contamination from expired septic tanks, waste from outhouses, runoff waste from residential neighborhoods, landfills that decompose into the water supply all contaminate well water and make wells risky.

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<sup>114</sup> Ibid.

Well contamination increases the importance of potable water supplies like the one provided by ENACAL. However the quality of ENACAL's water sources are also an issue. Many of the people I interviewed during my time in Bluefields indicated that they did not feel safe consuming ENACAL's water.<sup>115</sup> Perceptions of water contamination can be just as harmful as an actual contamination because resident will resist using it or may mix it with unclean supplies. The public perception of the water quality of ENACAL's potable water has caused many residents to resort to chlorine pills or boiling for treatment.

Bluefields Bay (see figure 9) is particularly polluted. Water from Bluefield's population and industrial activities is the main source of pollution.<sup>116</sup> However, upstream deforestation has plunged a lot of debris into the water causing the water to begin collecting deadly chemicals and changing colors. Waste from the slaughterhouse, the shipyards, hospital, and seafood industry have decimated the water quality of the bay. Also the water is not fresh, prompting the need for desalination.<sup>117</sup>

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<sup>115</sup> "Collection of Interviews Anonymous" Verbal, February 2011.

<sup>116</sup> Carlos L. Brenes, Aldo Hernández, and Daniel Ballesteros, "Flushing time in Perlas Lagoon and Bluefields Bay, Nicaragua," *Investigaciones Marinas* 35, no. 1 (2007): 89-96.

<sup>117</sup> ENACAL, "ABC Sobre El Recurso Agua y Su Situacion en Nicaragua."

Figure 9 – Bluefields Bay



## PUBLIC OPINION

The majority of people that I interviewed in Bluefield indicated that water was a problem. Only one person surveyed indicated that water was not a problem. When asked if water was a problem, this resident replied it was not, “because you can just buy some.” This resident was admittedly more well off than most in the region and also had no dependents. The majority of my interviewees did not have access to potable water and a few did not even have a well. The families that did not own wells claimed that they paid neighbors for the right to use their wells. Residents that had potable water noted that potable water is only available sometimes. When potable water is unavailable they must buy water from a neighbor’s well. No one I interviewed indicated that they felt safe drinking the potable water or well water. They also did not feel safe giving water to their small children to drink or even to bathe. Most residents with small children bought bottled water for every water purpose. The majority of my respondents also indicated that they were very afraid of water borne disease.<sup>118</sup>

Several of the people that I interviewed indicated that they bathed in rainwater when they had both well water and potable water available. One of the respondents even used a “well like” while in the ground for her latrine. She indicated that even though she had no well or potable water that sanitation was her biggest problem. Her latrine simply drained into neighboring wells from which she got her water. The health of small children seemed to be the biggest concern on average and most people had concerns for anyone who consumed the water. Sanitation really becomes a huge issue in small, highly populated neighborhoods where waste from one property can contaminate the wells of another.

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<sup>118</sup> “Collection of Interviews Anonymous”



All of my interviewees were Afro-descendants; therefore it is impossible to compare their views with views from other groups represented in Bluefields. This data would have been interesting. This is an oversight of the study. Afro-descendant populations worried about water, usually had multiple sources for use, tended to use bottled water when fiscally possible for small children, and generally had no hope for potable water in their area. Afro-descendant populations that had access to potable water were scared about the conditions of the water and consequently treated it with chlorine pills or boiling. Overall, Afro-descendant public opinion was concerned but not alarmed. People spoke about the importance of water and sanitation but few seemed to think that is was something that they could do anything about. This however is understandable considering the other problems Bluefields has such as crime, lack of employment opportunities, and housing conditions.

### **“MULTI-SOURCE” SOLUTIONS**

The lack of infrastructure for water and sanitation services in Bluefields affects every level of the population in some way. For low waged residents concern for water and sanitation is a daily occurrence. Even those residents who have access to these services are still concerned given the low quality and instability of the current system. As a result, residents in Bluefields often resorted to a practice that I call the “multi-source” solution. This solution involves finding diverse, relatively constant sources of water to create a water solution. One such source of water is well water. Wells are very popular in Bluefields. Most people either have one or have access to one nearby. Potable water provided by ENACAL is also a source of water for these populations. The dependability and coverage area of potable water don’t allow it to be a “single source” solution.

Residents also collect rain water and store it. This method is particularly frowned upon by groups like ENACAL because of the rate of contamination in rain supplies. However, residents often treat both rainwater and ENACAL's potable water. The final source of water for residents is bottled water. Prices range from an affordable 40 Cordobas (\$2) for a 5 gallon jug to 20 Cordobas (\$1) for a liter of bottled water. Buying in bulk is the key in Bluefields, because smaller bottled water sizes are usually sold at additional cost to the consumer. Nevertheless, water is prohibitively expensive for people with limited incomes. Overall, every resident of Bluefields employs more than one of these solutions, but many employ them all.

The "multi-source" solutions available in Bluefields help the population to survive but it is also crippling the city's ability to provide effective services. Many people in Bluefields indicated that water service is a problem, but that the solutions were already available. For example one solution is if there's no potable water then residents will use wells. Many residents see this as a water solution. At times it appears ENACAL believes this as well, perhaps this is a reason for ENACAL's relatively small investment in Bluefields. The reality is that "multi-source" solutions cannot substitute for an entire modern water network. There are quality issues, water rights issues, and regulator factors that limit the effectiveness of a "multi-source" solution. In the short term, "multi-source" solutions are a semi-effective way to try to create sustainability without government help but, in the long term, this setup will cause more problems than it fixes.

### **Financial and Time Problems with "Multi-Source" Solutions**

The biggest problem with the "multi-source" setup employed by most of Bluefield's residents is time. Lack of infrastructure in the form of potable water hookups

requires that residents go out in search of clean water supplies. Time is required to try to find new sources of water and procure them. A lot of the time this is done by a younger female in the family, who has to go in search of supplies everyday. Sometimes however primary providers for their families are tasked with this responsibility. In this instance providers must put their money seeking activities, like work, on hold in order to get water. Sometimes providers even have to pay for the water adding additional costs to the opportunity costs of daily collection. In the case of Bluefields, the almost nonexistent coverage of potable water creates additional costs that must be borne by the population. Time, money, and physical sickness from lack of access to water or ingestion of contaminated water provide a heavy burden for residents who need a solution to their “multi-solution” problem.

Water issues disproportionately affect the Afro-descendant community in Bluefields and as a result “multi-source solutions” have a larger effect on this population. Families that experience unemployment, live in inadequate housing, and eat lower quality foods devote time to finding clean water sources when they could better use their energy creating additional sustainability with the right water resources. They are at much higher risk to health issues like gastroenteritis and other water-borne diseases. Lower income families are also unable to afford bottled water when no other sources are available and will most likely use contaminated water to satisfy their water needs. While many Afro-descendant communities see the “multi-source solution” as the most satisficing solution, ENACAL and the Nicaraguan state should not share in their sentiment.

## **MANAGUA V. BLUEFIELDS**

The table below shows Bluefields official water supply compared to Managua's water supply. The numbers are stunning and provide perhaps the best evidence of systematic marginalization of Afro-descendants by the Nicaraguan state. Proportionally Bluefields has approximately 25 percent of the population of Managua. However, Bluefields only has 3.17 percent of the connections that Managua has totaling 213,248 fewer connections. Bluefields also has only 1.37 percent of the production of Managua totaling 158 million fewer cubic meters of water. Bluefield's aqueducts are relatively proportional to its population, however if you take into account Bluefield's landmass, Bluefields only generates 1.24 percent of the revenue of Managuan water systems and has problems supplying its population (see table 5). Managua's water system is largely self-sustaining due the revenue created by selling the service. Bluefields, however, cannot make this claim, although the possibility to create a self-sustaining system in one of Nicaragua's largest population is certainty there. The number presented in the table show the inequities discussed in the history section and the divide between the Pacific coast and the Atlantic coast. These discrepancies cannot be boiled down to a single reason, instead there multiple, historical oppressions acting below the surface.

	<b>Managua</b>	<b>Bluefields</b>	<b>Difference</b>	<b>% Difference</b>
<b>Size Km<sup>2</sup></b>	3,672	27,407	23,735	746.38%
<b>Population</b>	1,093,760	272,252	-821,508	24.89%
<b>Connections</b>	220,223	6,975	-213,248	3.17%
<b>Production m<sup>3</sup></b>	160,495,432	220,022	-158,295,209	1.37%
<b>Invoice Amount</b>	\$35,609.7	\$441.2	\$-35,168.5	1.24%
<b>Aqueducts</b>	28	6	-22	21.43%

Table 5 – Bluefields v. Managua Official Water Supply<sup>119</sup>

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<sup>119</sup> ENACAL, “ABC Sobre El Recurso Agua y Su Situacion en Nicaragua.”

## SUMMARY AND CONCLUSION

Bluefield's water situation is dire. Residents of the city literally must hustle each day to find water resources in order to live. This activity cuts into their ability to secure funds from other activities during this time, places health risks on their families from contaminated sources, and creates unhealthy outcomes for society at large. The afro-descendant population of Nicaragua is concentrated in the RAAS and particularly Bluefields. Uneven negative health outcomes between Bluefields and Managua point to a continuing historical battle for resources and autonomy between social groups. Unfortunately for Bluefields and its citizens, infrastructure development has been inadequate and indicators remain stagnant. Many afro-descendant and indigenous neighborhoods are void of water and sanitation services. Even in places where water coverage is available the service is unreliable and has quality concerns. Waste from businesses and residents pour into the Bluefields Bay contaminating the water supply and poisoning the plants and animals that depend on the bay. Afro-descendant fishers and chefs ability to provide for their families is hurt and the community's development is suppressed in afro-communities and other communities. Sustainability, as a result, is further weakened and Afro-descendent communities remain stagnant.

Sustainability is an afterthought, in the current situation, as water supplies are secured day by day. In order to create sustainable conditions that can help Afro-descendant populations we must return to our working definition of sustainability.<sup>120</sup> The first requirement for sustainability, according to our definition, is that "development [that] must meet present needs. This is clearly not occurring in Bluefields. Residents are

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<sup>120</sup> "Development that meets present needs, without compromising the ability of future generations to meet their needs, while simultaneously integrating resources, like land, water, and energy, into development designs paying close attention to the optimal satisfaction of all the members of society."

in dire need of water and sanitation services but cannot secure them for themselves. The next requirement is that this development should not “compromise the ability of future generations to meet their needs.” At this rate, pollution in Bluefields Bay is a serious and very real concern for the future. Lack of a comprehensive sewage system causes waste to runoff into the bay from industrial and residential properties affecting wildlife and certain professions. It is doubtful that, if things continue at their current pace, future generations will not be negatively affected in a big way. The next requirement in our definition requires that development “simultaneously integrate resources like land, water and energy into development designs.” This is clearly not happening in Bluefields, a city that also has energy issues. Water has historically been absent from city planner’s minds in Bluefields. As a result, there is no sanitation system or water system covering the entire city. The desalination plant is expensive and unnecessary. There are questions about the plausibility of constructing these systems in Bluefields contemporary condition, and sadly it seems like discussion about the construction of these systems are not underway today. The last qualifier our definition leaves us with is that development “pays close attention to the optimal satisfaction of all the members of society.” It is my contention that this does not occur in Bluefields. Lack of infrastructure and financing, from the Nicaraguan government, points directly to the marginalization of Afro-descendant populations in Nicaragua. Afro-descendants are affected disproportionately by the Nicaraguan state’s decisions not to invest in the regions water infrastructure. As a result, the optimal satisfaction of all members of Coast society is not reached. It seems that sustainability is a long ways off in Bluefields at this time, and attempts to create sustainability have largely been ignored.

Policy makers in Nicaragua have historically ignored Afro-descendant communities. These communities function as living networks “undergoing continual

structural changes.” In the case of water in Bluefields, physical structural changes have not occurred in some time and the data collected by this study suggests that social structural has also remained the same. Perhaps the most important requirement of our definition of community is the requirement that communities exist in “intrinsically democratic settings.” Currently there is no dimension of democratic action based around clean water and sanitation. Communities regardless of their thoughts about water must deal with Nicaraguan entities, like ENACAL, who seem to be completely comfortable with “multi-source solutions.” Afro-descendant’s distrust of water supplies has also been ignored, and the community’s democratic voice silenced as a result. Community joins sustainability in Bluefields as factors that fall by the waist-side in the eyes of the Nicaraguan Government.

Overall, the system that is in place today for water and sanitation in Bluefields is unsatisfactory. Afro-descendant outcomes in this system are also unsatisfactory and point to a long history of exclusion and marginalization. In order for progress to be made, Managua must respect residents of Bluefields and Afro-descendant population’s right to pursue sustainability. Close attention must be paid to the ways that Afro-descendants interact with water and the ways in which they have traditionally been marginalized. The development of community-based systems is an interesting idea, but the opportunity costs placed on low-income residents under this scenario is inefficient and may cause economic harm to residents. NGOs can play an important part in the building of infrastructure and the distribution of clean water supplies. However, funding for water infrastructure in Bluefields is something that is not easy to obtain from large foundations and NGO actions allow the government to continue to marginalize populations. The following section explores some recommendations and offers alternatives to the inefficient setup that currently is in place.



## RECOMMENDATIONS

The following recommendations are designed to mitigate the water problem of Afro-descendant populations on the Atlantic Coast of Nicaragua:

(1) Increase funding for Bluefields water and sanitation infrastructure. Increased funding should result in the construction of both water and a sanitation infrastructure system that serves the entire city. This system should be designed with future expandability in mind and with improvements to the availability of potable water. A dependable sewage system would cut down on contamination of wells from residential waste and reduce the pollution that is dumped in the bay. Dependable potable water systems means residents will have less health risks and opportunity costs associated with securing water will be negligible.

(2) Create an institution for Afro-descendant sustainability issues. Historical cleavages between Pacific *Mestizos* and Atlantic Afro-descendants have lead to marginalization and invisibilization for the Atlantic Coast at the hand of successive Nicaraguan governments. If social problems are ever to be solved there must be an entity dedicated to just that. It is unreasonable to assume that hundreds of years of conflict between two parties can end without some mediation. Aside from the social benefits of an Afro-descendant institution, there are innumerable benefits attached to the collection and analysis of data pertaining to the living conditions of Afro-descendants on the Atlantic Coast. An institution, which attempts to destroy historical cleavages and collect data on Afro-descendants as a means to enact change is an institution that Afro-Nicaraguans have never been able to secure but need very much.

(3) Provide regulations for businesses in Bluefields Bay. Contamination of the Bluefields Bay is serious and requires immediate action. Adequate sanitation infrastructure would go a long way to reducing pollution in the bay. However, the biggest polluters of the bay are industrial businesses that simply aren't regulated. Slaughterhouses, shipping yards, and commercial vessels should not be allowed to use the Bay as a dumping ground for unneeded materials. One solution is to ask businesses, which have been responsible for most of the pollution in the bay, to build infrastructure systems that properly dispose of their waste. Companies will be resistant to these regulations, but if companies like the United Fruit Company can build large railroad infrastructure to transport goods, then it's not unreasonable to assume that other companies can build infrastructure to cleanup their waste.

(4) Consider subsidizing bottled water prices for low socio-economic levels of society. One of the key features of water problems in Bluefields is the high price of bottled water. Some residents cannot afford bottled water at all. The Nicaraguan government should consider putting a price ceiling on bottled water in the Atlantic Coast. Some officials may think that it is unfair to retroactively do this in only one part of the country, but potable water services provided by the government are totally unsatisfactory in that very same part of the country. This solution would allow populations to purchase water from a nearby store instead of spending time seeking new sources or ingesting contaminated water.

(5) Move away from desalination (too expensive) and move towards other systems. ENACAL must move away from desalination practices in order to be able to hope to serve the entire population of Bluefields. Bluefields already low budget

constrains ENACAL to solutions that have low per person costs. The desalination plant in Bluefields does not produce much potable water and only serves a small portion of the population. The small client size and minuscule amounts of potable water create very high per person costs. A much smarter solution to this problem is to begin to pump nearby aquifers and to forget about non-freshwater sources.

(6) If historical tensions between Pacific and Atlantic continue prepare legislation to provide equal (or at least proportional) funding for both regions. This recommendation is key. There are historical tensions between the two coasts and unfortunately no one available to serve as a mediator. Autonomy for regions on the Atlantic does not mean independence. These departments still depend on Managua for funds and are Nicaraguan territories. Legislation is needed to require, by law, that both departments receive equal funding based proportionally on the population of their region. Implementing this recommendation would go a long way to solving many of the problems of Afro-descendant populations on the Atlantic Coast of Nicaragua.

## **Possibilities for Further Research**

I am interested in exploring this work in further detail in the future. Water problems on the Atlantic Coast do not seem to be improving, particularly for Afro-descendant populations. Time and budget limitations on this project limited the amount of in-depth research I could have done on Afro-descendants. Another study with a lot more resources would be needed in order to capture this data. I would also like to explore loans, specifically micro-loans, in the area. Microloans also make up an important part of sustainability and can help the growth of a community tremendously.

I would also like to expand my studies to Afro-descendant communities outside of Bluefields. This was the original intent of my report but the scope of the project dictated a focus on Bluefields in general with an Afro-descendant focus instead of the other way around. Rural water problems are much worse in the RAAS than urban areas, and that saying a lot. A comparison of Managua's rural areas to Bluefield's rural areas would be interesting to look at. NGOs and their involvement on the coast was minimal according to my research but further exploring this aspect of water in the RAAS would be interesting as well. I don't know if I will ever be able to complete this project to my complete satisfaction but I hope that this document serves as an important base for future sustainability researchers on the Atlantic Coast of Nicaragua.

## Appendix

## **INTERVIEW WITH CARLOS LEABA ENACAL**

3<sup>rd</sup> Houses before Tiptop Restaurant, Bluefields, RAAS, Nicaragua

9:05 am

2/16/2011

**Q: What is your job description?**

A: I am the director of the ENACAL delegation for Bluefields. I live and work here in Bluefields.

**Q: Please tell me about water in Bluefields**

A: Well first there is a water plant, a desalination plant. It has a capacity of production of 70 cubic meters per unit per hour. It has three units. Therefore its maximum output is 210 cubic meters per hour. It runs on a process called “osmosis inversa” which removes salt through a reverse process of osmosis.

**Q: How many people does this plant serve?**

A: The plant only serves 5 barrios. It has a total of 1,420 clients.

**Q: How do you feel about water in Bluefields? Is it good, bad? Are you indifferent?**

A: Water here is not very good at all. There are many troubles with the machines that we use to provide the water. Managua needs to send parts so that we can fix the machines.

We are also not very efficient but we can only do what we can do. We only serve approx. 8% of the population here. There is a real lack of Government funding and a lack of government resources overall. There is not enough money or parts to fix things.

It costs us 500,000 (\$25,000) Cordobas per month to preform our duties. Our supervisors at ENACAL Managua only provide us with 160,000 Cordobas (\$8,000) per month. So the difference here is a real problem. Sometimes we cannot even run the plant. We have the equipment and sometimes we don't have the money to use it.

## Bibliography

- Bello, Alvaro, and Marta Rangel. "Equity and exclusion in Latin America and the Caribbean: the case of Indigenous and Afro-descendant peoples." *Cepal Review* (April 2002).
- BlueEnergy. "BlueEnergy group." *About Us*, n.d. <http://www.blueenergygroup.org/spip.php?rubrique126&lang=en>. (accessed April 13, 2011).
- Brenes, Carlos L., Aldo Hernández, and Daniel Ballester. "Flushing time in Perlas Lagoon and Bluefields Bay, Nicaragua." *Investigaciones Marinas* 35, no. 1 (2007): 89-96.
- Brown, Becky, Mark Hanson, Diana Liverman, and Robert Meridith. "Global Sustainability: Toward Definition." *Environmental Management* 11, no. 6 (n.d.): 713-719.
- Canales, M.K. "Othering: Toward an Understanding of Difference" 22 (n.d.). [http://journals.lww.com/advancesinnursingscience/Fulltext/2000/06000/Othering\\_Toward\\_an\\_Understanding\\_of\\_Difference.3.aspx](http://journals.lww.com/advancesinnursingscience/Fulltext/2000/06000/Othering_Toward_an_Understanding_of_Difference.3.aspx).
- Capra, Fritjof. *The Hidden Connections: A Science for Sustainable Living*. Harper Collins, 2004.
- Castro, Alma Rosa. "The State of Water and Sanitation, RAAS, 2007", 2007.
- Centeno, M.A. *Black and Debt: War and the Nation-State in Latin America*. University Park: Pennsylvania State University Press, 2002.
- "Collection of Interviews Anonymous" Verbal, February 2011.
- Davidson, William V. "The Garifuna of Pearl Lagoon: Ethnohistory of an Afro-American Enclave in Nicaragua." *Ethnohistory* 27, no. 1 (Winter 1980): 31-47.
- ENACAL. "ABC Sobre El Recurso Agua y Su Situacion en Nicaragua". ENACAL Managua, December 2007.
- Encarta Online. "Nicaragua", n.d.
- Evans, Peter. "The Eclipse of the State? Reflections on Stateness in an Era of Globalization." *World Politics* 50, no. 1 (n.d.): 61-87.
- Friedland, Lewis. "Communication, Community, and Democracy." *Communication Research* 28, no. 4 (2001): 358 -391.
- Goett, Jennifer. "PNUD-Informe del Desarrollo Humano de la Costa Atlántica de Nicaragua: Tenencia de las tierras comunales indígenas y afro-descendientes en la RAAS", December 4, 2004.



- Gordon, Edmund, and Mark Anderson. "The African Diaspora: Toward an Ethnography of Diasporic Identification." *The Journal of American Folklore* 112, no. 448 (1999): 282-296.
- Green, Lawrence. "Can Public Health Researchers and Agencies Reconcile the Push From Funding Bodies and the Pull From Communities?" *Community-Based Participatory Research* 91, no. 12 (December 2001).
- Hale, Charles R. "What is Activist Research". SSRC, 2001.
- Hooker, Juliet. "Afro-descendant Struggles for Collective Rights in Latin America: Between Race and Culture." *Souls* (2008): 279-291.
- — —. "Indigenous Inclusion / Black Exclusion: Race, Ethnicity and Multicultural Citizenship in Latin America." *Journal of Latin American Studies*, no. 37 (2005): 285-310.
- INIDE. "VIII Censo de Poblacion y IV de Vivienda". El Instituto Nacional de Información de Desarrollo, 2005.
- "Instituto Nicaragüense de Estudios Territoriales - INETER", n.d. <http://www.ineter.gob.ni/index.php>. (accessed April 11, 2011).
- Inter-American Consultation on Race in Latin America. "Inter-American Dialogue Race Report", January 2003.
- Interamericana. "A Brief History of Autonomy | Interamericana", July 13, 2010. <http://interamericana.co.uk/2010/07/a-brief-history-of-autonomy/>. (accessed November 30, 2010).
- "Interview with Carlos Leaba ENACAL." Written, February 13, 2011.
- Johnston, Paul, Mark Everard, David Santillo, and Karl-Henrik Robert. "Reclaiming the Definition of Sustainability." *Env Sci Pollut Res* 14, no. 1 (2007): 60-66.
- Marx, Anthony. *Making Race and Nation: A Comparison of the United States, South Africa, and Brazil*. Cambridge, UK: University of Cambridge Press, 1998.
- Meade, Teresa. *A Modern History of Latin America: 1800 to the Present*. Wiley-Blackwell, 2007.
- Minority Rights Group International. "Minority Rights Group International : Brazil : Afro-Brazilians." *World Directory of Minorities*, n.d. <http://www.minorityrights.org/?lid=5285&tmpl=printpage>. (accessed November 29, 2010).
- Ramsey, Patrick. "Bluefields, RAAS, Nicaragua", n.d. <http://www.amigosdenicaragua.org/bluefields.htm>. (accessed December 1, 2010).
- Rapaport Center for Human Rights and Justice. "Unfulfilled Promises and Persistent Obstacles to the Realization of the Rights of Afro-Colombians.", 2007.

- Rogers, Tim. "Mosquito Coast Bites Nicaragua's Ortega - TIME", n.d. <http://www.time.com/time/world/article/0,8599,1894376,00.html>. (accessed December 1, 2010).
- Roseland, Mark. "Sustainable community development: integrating environmental, economic, and social objectives." *Progress in Planning* 54, no. 2 (2000): 73-132.
- The Centre for Sustainable Development. "Sustainable Development: A review of the International Literature". University of Westminster, 2006.
- United Nations. "A/RES/42/187 Report of the World Commission on Environment and Development", 1987. <http://www.un.org/documents/ga/res/42/ares42-187.htm>. (accessed May 1, 2011).
- — —. "General Assembly Adopts Resolution Recognizing Access to Clean Water, Sanitation as Human Right, by Recorded Vote of 122 in Favor, None against, 41 Abstentions", July 28, 2010. <http://www.un.org/News/Press/docs/2010/ga10967.doc.htm>. (accessed December 1, 2010).
- USGS. "The Water Cycle", n.d. <http://ga.water.usgs.gov/edu/watercyclehi.html>. (accessed April 11, 2011).
- — —. "Water Science." *The Hydrologic Cycle, USGS pamphlet, 1984*, n.d. <http://ga.water.usgs.gov/edu/earthhowmuch.html>. (accessed April 11, 2011).
- Vieira, R.K. "Designing sustainable developments." *Solar Today* 4, no. 5 (n.d.): 10-13.
- World Directory of Minorities. "The Atlantic Coast Autonomy Law (Extracts) - World Directory of Minorities", n.d. <http://www.faqs.org/minorities/Appendices/The-Atlantic-Coast-Autonomy-Law-Extracts.html>. (accessed November 30, 2010).
- World Health Organization. "Health in the Americas". WHO, 2007.
- World Water Forum. "Water Problems in Latin America". World Water Council, February 3, 2004.