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A Political Ecology of Solid Waste Management in Niadub, Panama

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A POLITICAL ECOLOGY OF SOLID WASTE MANAGEMENT IN NIADUB,
PANAMA

By

Marc L. Fruitema

A THESIS

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of the University of Miami
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A thesis submitted in partial fulfillment of
the requirements for the degree of
Master of Science

A POLITICAL ECOLOGY OF SOLID WASTE MANAGEMENT IN NIADUB,
PANAMA

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A Political Ecology of Solid Waste Management in Niadub, Panama

Abstract of a thesis at the University of Miami.

Thesis supervised by Professor Sarah K. Meltzoff.
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As indigenous communities across Latin America embrace modernization and undergo rapid development, safe and effective waste management becomes an important environmental and public health concern. Far too often, these marginalized groups are excluded from decision-making in the development processes and international conservation projects that address a host of population, health and environmental issues in their own communities. Waste Management projects and initiatives led by international organizations have not only excluded local interest groups from planning and administration, they disregard socio-cultural values and community needs in the process. This has led to far too many failed attempts at addressing pollution concerns and waste-management in developing countries and exacerbates the marginalization of these cultures.

This case study assessed the potential of ethnography and political ecology as valuable tools in the waste management-planning framework. The application of these research methodologies was evaluated in Niadub, Panama, by using this approach to attempt to understand the social and cultural context of waste management in the small indigenous Guna community. Through in depth life & work histories and semi-structured interviews, an understanding of Guna cosmology, cultural norms and community values was developed. Discussion groups were organized with select interest groups to collect
their perspectives on current waste-management strategies, perceived impacts of waste management practices and the potential for an improved waste management plan.

What this research showed was a long-standing cultural understanding of garbage, its potential negative impacts and the need for proper management. Even as Niadub has modernized and the waste stream has become inundated with modern plastics, the social organization and cultural values have remained fundamentally the same. Although fragmented by foreign funding and exclusionary conservation projects, community interest groups remain concerned and motivated to improve the village’s waste management strategy.

Waste management is a complicated affair that transcends the political, economic, social and environmental realms. Understanding the complexity of these issues and the interest groups involved necessitates a deeper level understanding of the socio-cultural context. In using the ethnographic and political ecology approach, this study was able to validate their application towards developing that in-depth appreciation.
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CHAPTER 1: INTRODUCTION

The Guna people of Panama are a unique political and cultural force within Latin American indigenous cultures. They lead as a beacon of inspiration for many different indigenous struggles across Latin America due to their triumphs in securing autonomous lands and governance from the repressive Panamanian Government in 1938.

In the present day however, Guna communities find themselves marginalized by the National government, without access to clean water, electricity or adequate health services. As acculturation and changing livelihoods have increased demand for imported canned, plastic-wrapped and bottled goods, the disposal of solid waste has become an environmental catastrophe with serious public health implications (Hoehn, 2009). There has been so much pollution from organic and non-organic pollutants (wrapping materials, containers, batteries, gasoline’s, solvents, varnish etc…) that water quality has reached contaminated levels (Hoehn, 2009). Trash litter has supported the spread of Dengue Fever and Malaria throughout the island communities. Skin and intestinal infections have become more common amongst children and eutrophication has become an ecological concern in local waters (Sponer, 2010).

These serious health and environmental issues pose serious threats to the communities and the ecosystems’ capacity to support them into the future. As this pollution starts to challenge the social-ecological resiliency of Guna communities, waste-management concerns and solutions must be discussed at the community level.
1.1. Literature Review

**Indigenous cultures and development**

While primarily geographically isolated from mainstream Panama, the economic isolation of the Guna mirrors that of other indigenous groups throughout the region. The most recent comprehensive study of indigenous peoples in Latin America (Hall and Patrinos 2006) found high rates of poverty across indigenous groups in the region. Despite a surge of international focus on the plight of these groups, efforts towards promoting inclusive and empowering development have been constrained by the inherent disconnect between indigenous groups and the central economies of the countries where they live. Addressing these deficiencies, in 2007 the United Nations passed the Declaration of Indigenous Peoples’ Rights. Intent on the advancement of indigenous peoples’, the declaration aimed to promote collaborative efforts between major development organizations and disenfranchised indigenous communities. Despite these best efforts, a lack of indigenous-specific indicators (Tauli-Corpuz, 2005) and understanding of the structural causes of indigenous poverty, there has been insignificant headway. As Tauli-Corpuz (2005) states, “indigenous peoples are invisible in country-wise assessments because of the focus on these reports on general averages, which do not reflect the realities of indigenous peoples”. This hampers the ability of bi-lateral institutions to truly understand the socioeconomic needs of indigenous peoples’ and implement appropriate development projects.

In Latin America, current estimates put the indigenous population between 28 million and 43 million, a figure representing 10 percent of the region. Once part of highly developed civilizations, the surviving populations’ disenfranchisement is evidenced by
poverty, education and health outcomes far below non-indigenous populations (Hall and Patrinos 2006). Nevertheless, these groups continue to exist and express their right to social, political and cultural autonomy. Hall and Patrinos (2010) attribute that survival of more than 100 living languages and cultures to their self-imposed geographic and economic isolation. For the Guna, their coastal migration towards the San Blas archipelago was pivotal in minimizing threats to their sovereignty and securing land ownership.

**Conservation Organizations and Indigenous Groups**

As development and conservation organizations increasingly sought to include indigenous and traditional peoples within the breadth of their projects, the question remains how effective they have been in actually doing this. The vision was for local groups to be included in every action and project. This would not only promote conservation research and sustainable development goals, it would empower local groups by supporting land defense and their human rights (Chapin, 2004). For Latin America, this was one of the most important milestones in regards to advances towards participatory management and inclusive development.

At the 1992 IUCN World Congress on National Parks and Protected Areas, the role of indigenous communities in environmental management was a major topic. In discussing the value of traditional knowledge (TK), indigenous traditions and strategic partnerships, the report set the stage in the international arena of NGO’s for mutual respect, aligned objectives and the valuation of all forms of knowledge (UNEP). This led
to the conceptualization of community-based conservation programs, which had integrated and complementary conservation and development objectives.

One of the underlying challenges affecting the integrity of this new approach was that indigenous groups and conservationists had a different vision for what they wanted to achieve through conservation projects. Indigenous groups were aiming to protect and legalize land rights, maintain their ability to exploit natural resources for profit without total destruction and document their history, traditions and cultural identity. Conservationists on the other hand had as their central objectives to establish protected areas and develop management plans. While these different interests can certainly be aligned, conflicting perceptions, knowledge systems and worldviews make co-management a very complex affair. These dynamic relationships require patience and respect to build the trust across cultures that will be vital to an equitable and collaborative partnership. These conflicting needs and visions for conservation and development continue to serve as barriers to collaborative and participatory partnerships.

**Community-based Environmental Management**

Due to the socio-political and ecological shortcomings of these top down centralized approaches to conservation, egalitarian and inclusive methodologies were sought as possible remedies (Campbell and Vainio-Mattila 2003). The exclusion and marginalization of local and indigenous communities further exacerbates existing socio-political inequalities and has contributed to their negative perceptions of governmental and non-governmental development agencies. These biases and borderline hostile
attitudes is what makes Guna Yala a very challenging research site, where cultural considerations must be prioritized.

In response to these growing concerns, a new model of conservation was formulated to actually incorporate the needs and interests of those local communities that had consistently been excluded. Community-based conservation (CBC) and community-based natural resource management (CBNRM) had three central objectives; “allow communities to regain control over resource management, strengthen local decision-making and improve human well-being” (Wainwright and Wehrmeyer 1998). These models became adopted and applied across the globe. However, evaluation brought evidence against the effectiveness of these new approaches as they were being developed and implemented. Four main weaknesses were identified by Mulrennan, Mark and Scott (2012).

1. Community-based approaches were working with oversimplified notions of homogeneous stakeholder composition. “In failing to account for multiple interests and actors, the uneven access of these actors, and the possibility of alliances with external factors, unrealistic expectations for community-based conservation initiatives were promoted” (Agrawal and Gibson 1999).

2. CBC agendas were designed, implemented and evaluated by outside organizations and trained scientists. “Fundamental principles of social justice and community empowerment were sidelined in favor of externally determined conservation agendas” (Mulrennan, Mark and Scott 2012).

3. With a heavy emphasis on end objectives, the participatory processes that are meant to nourish local involvement and ownership have become overlooked.
Organizations were seeking tangible success indicators as opposed to transformative change.

4. With inadequately trained natural scientists at the helm, local people were rarely given opportunities or platforms for deeper involvement and critical reflection in conservation projects. As mere “passive beneficiaries of project activities” (Wells and Brandon 1993) the participation of local peoples remained surface level and superficial.

Faith in the potential of these CBC approaches was lost, as many believed that “the focus on participation, development and equity diluted conservation goals” (Terborgh, 1999) and validated a return to resurgent protectionist conservation. Regardless, these conflicting opinions highlighted a need to re-examine and fundamentally re-structure the way research, conservation and development agendas are designed and how local communities are included in those processes.

As part of this new consciousness, community-based participatory research (CBPR) has been put forth as a collaborative approach to research that incorporates multiple perspectives and stakeholder groups. Already well established and validated within Public Health projects, this methodology has recently gained traction within resource management circles. Mulrennan, Mark and Scott (2012) provide a set of principles that don’t specify a specific methodology, but rather serve as a framework to guide this collaborative research. Principles that will play an important role in guiding the objectives of this research.
1. The community defines and drives the research agenda

2. The community is involved in all phases of the research with active measures taken to reallocate power and ensure reciprocal transfer (co-learning) of knowledge, skills and capacity

3. Research outcomes should benefit all parties, with the community receiving tangible and practical benefits as a result of their participation, in forms that advance social change and justice

While these guidelines assist in making research as transparent and collaborative as possible, Mulrennan, Mark and Scott (2012) caution against replication. Doing so with CBPR would negate the social dynamics and cultural context that define these research parameters. The entire focus of CBPR principles is to have local needs and socio-cultural values characterize the research process. Doing so will go great lengths towards promoting transferable knowledge pathways and supporting co-learning opportunities. While these are ambitious endeavors, promoting deeper learning throughout the research process will have important contributions to the reflective and evaluative capacities of local communities.

**Social Learning and Natural Resource Management**

As the literature shows, there is an increasing tendency to place stakeholders at the center of research design, implementation and evaluation. One thing that has become increasingly clear is a lack of knowledge concerning effective participatory learning processes and success indicators thereof. Simply building the framework for these inclusive and democratic decision making processes is not enough. Efforts must be made
to facilitate dialogue at every step and promote the generation of new knowledge that is ground-

Building upon decade’s old research concerning collective cognition and group learning processes, researchers have increasingly sought to connect these theories of learning to participatory resource management approaches. To prove that these models can have positive outcomes and contribute to social change. The last 10 years have seen an increasing amount of literature concerning “social learning” and its applications within community based resource management initiatives. Van der Wal et al. (2013) define this learning as a factor of three conditions that must be present if it were to be considered “social learning”.

1. A change in understanding in individuals
2. A perspective shift that goes beyond the individual
3. It occurs through social interactions between actors in a social network

With capacity building and stakeholder engagement a key objective of participatory approaches, social learning of stakeholders is increasingly seen as a valuable component (Reed et al 2010). By bringing stakeholders together to collectively assess the problem at hand and reflect on potential solutions and pathways, the literature suggests these communities of practice may undergo a collective shift in consciousness. Supporting this communal process of critical reflection and discussion creates a platform for adaptive solutions that engages the support and action of a community’s diverse and heterogeneous stakeholders (Van der Wal, 2013). Social learning’s potential and value as a governance mechanism supporting resource management and climate adaptation efforts
has been well documented over the last decade (Blackmore, 2007; Bouwen and Taillieu, 2004; Pahl-Wostl et al., 2007).

Social learning can therefore be a valuable objective complementing the principles of CBPR. However, while research has shown that participatory processes may stimulate social learning, as they are inherently separate, this cannot be an underlying assumption (Reed et al, 2010). One is a process, while the other a potential outcome of that process. It must also be emphasized that social learning cannot necessarily be associated with sustainability learning or environmentally friendly outcomes. While this may be the case, the collective learning process can also result in consensus regarding ecologically destructive behavior and practices (Reed et al, 2010).

Indigenous Knowledge and Traditional Ecological Knowledge

Promoting these shared learning platforms is even more important within indigenous communities. As indigenous cultures have their own unique cosmological beliefs and knowledge systems, it is crucial that any development, conservation or research efforts valorize and include this “indigenous knowledge” in the planning, implementation and evaluation process. Those participatory processes must also serve to reinforce indigenous knowledge networks and belief systems. Following the review of Ruiz-Mallen and Corbera (2013), I will apply the term traditional ecological knowledge. This is defined as:

*People’s cumulative body of nonscientific knowledge, beliefs, and practice about local ecosystems and their management that evolves through social learning and adaptive processes, and which is supported by customary institutions and handed down through generations by cultural transmission.* (Berkes, 1993)
Many studies have already demonstrated how these knowledge systems can fortify communities’ capacity to deal with climate change and the decision-making processes involved in the management of environmental affairs (Berkes, 2007; Grant and Berkes, 2007). As with outsider-driven research programs, local NGO’s must include social development and capacity building in their agendas to enhance community livelihoods, ameliorate their adaptive capacity and reduce the dependency on foreign (national or international) aid.

**Small Island Developing States**

While not a nation state of their own, Guna communities in the archipelago have many of the same defining characteristics as Small Island Developing States (SIDS). As part of the Millennium Development Goals, the United Nations Conference on Environment and Development have put an emphasis on the needs and conditions of SIDS, as “they are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from market, place them at a disadvantage economically and prevent economies of scale” (Banuri, 2010). These features present severe challenges to sustainable development goals and social-ecological resiliency in the face of modernization and climate change. As populations grow and concentrate around urban centers, the need for responsible planning and development is more important than ever. Densely populated island communities and urban settlements along the coast exert increasing pressure on coastal ecosystems, necessitating adequate social services that serve to prevent environmental pollution and public health epidemics (Banuri, 2010). As seen in Guna Yala, the lack of clean water access and sanitation services has brought a
host of public health and environmental concerns. This not only threatens the livelihoods of these coastal communities, but also their unique cultural heritage and traditions. All of these issues question the indefinite viability of these communities and island states as they presently exist. Without significant efforts to bolster the problem-solving capacity at the local community level, the ecosystems’ capacity to support these populations might collapse. Plagued by pollution, marine debris and the overharvesting of natural resources, their livelihoods and resiliency are extremely fragile.

**Integrated Solid Waste Management in Developing Countries**

As communities and SIDS modernize through rapid industrialization and urbanization, the volume and types of solid waste become a pressing concern. With serious socio-environmental considerations, the effective and sustainable management of the solid waste stream should be an utmost priority. With an already consternating 7% annual increase of municipal solid waste since 2003, UNEP projected a further 37.5% increase between 2007 and 2011 (UNEP). This escalating volume of waste not only requires appropriate infrastructure developments, but also a highly organized management system supported by stakeholder involvement. A massive problem to deal with on its own, municipalities must also safely manage hazardous waste, healthcare waste and E-Waste. In developing countries, this magnanimous social service consumes a large proportion of municipal budgets, with World Bank estimates putting it at 25-50% (UNEP). To exacerbate the demands of SWM, this figure only accounts for 40-70% of all urban solid waste, as half of the population is not reached by the SWM services (UNEP). Collection is also the most exhaustive function of waste-management, consuming about
80% of SWM budgets in low-income countries. Conversely, waste recycling and recovery efforts through community involvement means advanced countries only spend 10% of their SWM budgets on collection, leaving more for safe and effective treatment facilities.

As part of an Integrated Solid Waste Management (ISWM) approach, concerted efforts are made to reduce the final volume of waste through material recovery. Preventing SW from entering the waste stream through the 3R (reduce, reuse and recycle) principle (UNEP) reduces SWM costs and increases revenue generated through recycling efforts. While this holistic approach is certainly feasible, local needs and socio-cultural values must be considered and incorporated into the planning process. The US EPA planning process is outlined in Figure 1. As it shows, an integral part of this process is understanding the needs, existing management framework and regulations. Incorporating community stakeholders and local decision-making processes will lay the foundation for a cost-effective and safe SWM framework.
1.2. Purpose of Study

The purpose of this research was to conduct a case study on the value of ethnography and political ecology towards improving our understanding of the socio-cultural context of waste management.

As part of the case study, there were three research objectives: 1) Characterize past and present solid-waste management practices 2) Understand the socio-political relationships between interest groups involved in solid waste management 3) Capture and map interest group perspectives regarding the need and potential for improved SWM.
CHAPTER 2: METHODOLOGY

My methodology consisted of three components:

1. Before going into the field, a literature review was conducted looking at Guna culture, cosmology and socio-political organization. Published texts by Western and Guna anthropologists were used to understand the historical context of Guna communities, basic political organization at the village level and the evolution of socio-cultural norms over time. This information was complemented by the annual reports of NGO’s and development agencies working in Guna Yala that gave insight into the relationship between international conservation organizations and Guna communities.

2. The second component was fieldwork and data collection at my selected field site: the island community of Niadub, in the San Blas Archipelago along the Caribbean coast of Panama. Also known by its Spanish name, Tikantiki, its location can be seen on the far right in the figure 2 below.

![Figure 2. Map of Panama and the San Blas Archipelago (Hall and Patrinos, 2006)](image)

My fieldwork in Niadub was conducted over two separate field visits, the first in March 2013 for six days and then in June 2014 for 32 days.
During the first field visit, I used empathic ethnography (Meltzoff, 2010) to conduct open-ended interviews and life & work histories. Developed by Dr. Sarah Meltzoff, empathic ethnography is an approach that gives a deeper understanding of interest groups and their interactions through individual stories, histories and the socio-political and environmental context of their lives. Starting with key informants who fulfill a variety of functions within the community, I then used the snowball method to conduct additional interviews with diverse respondents.

In my second field visit, I used semi-structured interviews and discussion groups as part of a community based participatory research framework. As a collaborative research approach, community interest groups are involved in the research process, with an emphasis placed on participatory methods and reciprocal and group learning processes. This methodology was not only more culturally appropriate to the inclusive, discussion-style decision-making processes of the Guna, it can also provide rich information and help bring socio-environmental issues into the limelight.

Discussion groups were designed to understand and incorporate the perspectives and opinions of general community members into recommendations for a SWM framework. Discussion groups were designed and organized using the following guidelines:
Orally delivered survey and semi-structured discussion within 3 discussion groups.

<table>
<thead>
<tr>
<th>Group of 5-8 participants</th>
<th>Clearly introduce/explain purpose and topics to be discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderator (me) lead conversation with basic survey/questionnaire</td>
<td>~1.5 hr conversation</td>
</tr>
<tr>
<td>Discussion topics:</td>
<td></td>
</tr>
<tr>
<td>o Assessment of current waste management</td>
<td></td>
</tr>
<tr>
<td>o Impacts of current waste management on population, health and environment</td>
<td></td>
</tr>
<tr>
<td>o Pathway for sustainable waste management</td>
<td></td>
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Table 1. Outline for discussion group planning

Target audience:

<table>
<thead>
<tr>
<th>Spanish speaking</th>
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<tr>
<td>Diverse composition: age, sex, occupation, status</td>
</tr>
<tr>
<td>Women, Congreso leadership, Community health workers and members of Balu Uala,</td>
</tr>
</tbody>
</table>

Table 2. Discussion group target audiences

Conducting this orally delivered and discussion situated surveys within discussion groups was meant to foster a collective discussion that complements the communal style of working groups and family units within Guna culture. I hoped to challenge participants to think critically with their peers about the problem at hand and at what level they value the welfare of their community and environment.

3. Finally, information, interviews and discussion groups were transcribed and qualitatively analyzed upon returning from the field. Through key word analysis (Russell, 2011), transcribed results were analyzed for repeating words and analogies, seeking out common themes upon which conclusions and categorizations could be developed.

The collected results were also analyzed through interest group mapping (Meltzoff, 2010), whereby groups and their perspectives were mapped out to understand
the different perceptions, potential alliances and conflicts. This process also lays the groundwork for participatory management, as the capacity and motivation of groups to support a project is elucidated.
CHAPTER 3: RESULTS

The following results were gathered through life & work histories and semi-structured interviews with a total of 49 respondents. Of the 49 participants, 19 were women, and 30 were men. A more equal distribution of male / female respondents was desired, but the women were less open to speaking with a foreign male.

The following figure depicts the self-identified occupations of the respondents when asked to select one. Note that besides the community health worker, all the women identified as the head of household. For the men, those who identified themselves as fishermen saw that as their primary occupation, while the others fulfilled roles that did not permit them to fish full time.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number</th>
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<tbody>
<tr>
<td>Head of Household</td>
<td>18</td>
</tr>
<tr>
<td>Fishermen</td>
<td>12</td>
</tr>
<tr>
<td>Village Chief</td>
<td>2</td>
</tr>
<tr>
<td>Congreso Secretary</td>
<td>1</td>
</tr>
<tr>
<td>Congreso fiscal secretary</td>
<td>1</td>
</tr>
<tr>
<td>Traditional Healer</td>
<td>3</td>
</tr>
<tr>
<td>Shopkeeper</td>
<td>4</td>
</tr>
<tr>
<td>Baker</td>
<td>1</td>
</tr>
<tr>
<td>Balu Uala promoter</td>
<td>4</td>
</tr>
<tr>
<td>Health Worker</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3. Occupations of interviewed respondents

3.1. A Historical Perspective of Waste Management in Guna Yala

This first section presents the combined information gained through a literature review and in-depth life & work histories with diverse residents of Niadub.
The scale of the problem as we know it today has developed in tandem with more transformative developments impacting the lifestyles and culture of the Guna. As we attempt to understand the current framework of solid waste management in this community, it is critical to keep it embedded within the historical context of these villages. This holistic background will help paint a picture of general socio-cultural trends that have come to shape the current waste-management framework.

The Guna have always had the notion of waste management embedded within their village culture and customary practices. Waste is produced as a by-product of daily life, and must therefore be dealt with accordingly. While the nature and composition of waste may change over time, it is still a fundamental concern for communities’ health and welfare. The collection and disposal of solid waste is a traditional practice with equally important sanitary and cosmological significance. Besides removing biodegradable waste from within the household, it also serves to maintain the cleanliness and “wholeness” of the Guna family unit (Nunez, Interview). As a matrilocal society, the management of the household and family unit, and integrity thereof, has always been the responsibility of the women. The women have a responsibility to themselves, their families and community to keep their homes and land free from solid waste. The women are expected to sweep and clean the house three times a day, in the morning, mid afternoon and early evening. Using a bundle of twigs, they would brush the earthen floors inside and outside their homes, collecting any rubble, detritus or food waste. Once amassed in little piles, it could be collected in a basket and transported to the disposal site at the edge of the village (Nunez, Interview).
When they still lived in the forests on the mainland around 1800, villages were low density, spatially concentrated and grouped around the Congreso house (Howe, “Chiefs, Scribes” 68). The surrounding forests were typically used for agriculture and the production of staple crops. As part of the value that they place on community “cleanliness”, the Guna have always had a well-established norm of disposing their waste in a designated area of the village (Inanbayiga, Interview). Most commonly, these were the individual “fincas” (small agriculture plots) planted with subsistence crops that surrounded the community. Their autonomous existence and subsistence lifestyles meant that waste was entirely comprised of organic and biodegradable matter.

Trade and contact with the outside world was limited and as such the Guna lived primarily off of what they could harvest and supply from their forest environment. As discussed in the background section, it was not until they migrated towards the coast that modern tools and processed products became introduced through trade, with these gradually incorporated into village life. Once those Guna communities completed the migration to the coral islands of the archipelago, the traditional methods of waste management that had worked in the forests had to be replicated to their new environment. While they used to have their fincas in close proximity for fertilization, they were now surrounded by the Caribbean Sea. Although a fundamentally different ecosystem, traditional waste management practices did not change much. Crops that once benefitted from fertilization became sea grass beds, coral reefs and the marine environment, situated just at the periphery of the island community. That same cultural practice of the women collecting waste three times a day and disposing of it at the edge of the community
remained very much the same. The “sahilas” (village chiefs) were and continued to be instrumental in reinforcing this as an important function for community well being.

From the point of migration to about 70 years ago, the composition of solid waste generally remained the same. While trade ships have been plying the San Blas archipelago seeking trade opportunities for over two centuries, the exchange of goods has changed drastically. With coconuts a staple food in the Guna diet, the San Blas archipelago has been one of the most productive coconut producing regions in this part of the Caribbean. Furthermore, the beautifully hand-stitched molas that Guna women wear also became prized trade items (Howe, “A People Who Would Not” 47) Guna used to trade their highly prized coconuts in exchange for metal tools and products. Eventually food items like sugar and rice were added to the inventory of traders that established the flourishing and diverse trade system that exists today (Howe, “A People Who Would Not” 51). Eventually a cash economy became established in Guna Yala. Although there are many conflicting accounts of when exactly this transpired, most of my sources corroborated it was in the time of their “abuelos” (grandparents), which implies two or three generations ago. One source recounted a story of how her grandmother fashioned Panamanian coins into jewelry, as money simply had no established value within Guna communities at that time.

Many also credit the proliferation of this cash economy with the commercialization of lobster throughout the Comarca. Originally fished for personal consumption, traders were soon frequenting the islands of San Blas to source this valuable commodity for sale in Panama City and abroad. Besides commoditizing an abundant natural resource, this supported the growth of a cash economy in the Comarca
and the consumer culture that exists today. Somewhere around the 1950’s and 60’s, trade boats from Colon, Panama were coming to San Blas buying lobster from artisanal Guna fishermen. A resource once solely for personal consumption, became a lucrative commodity for export. To amplify the scale of this market, their harvesting capacity was exponentially magnified when a fishermen by the name of Carlos Ovario (Grimaldo, Interview) returned from a journey to Jamaica having learned how to use a “gancho” (snare) to target lobster. Through Peace Corps volunteers, this fishing technique quickly spread to neighboring islands (Grimaldo, Interview). Daily catches of 20 lobsters quickly increased to 200 lbs per team of divers. As buyers were offering Guna fishermen cold cash in exchange for all their lobster, the commoditization of this resource entrenched the functionality of currency within Guna. Rather than use it as jewelry, money could now be used in their exchanges with the trade ships passing through, and the Guna were afforded an unprecedented level of luxury and comfort.

This along with other variables has been a big driver of change among the Guna; their livelihoods, lifestyles and socio-cultural beliefs and values evolving with the introduction of cash-based economies. With money came a certain level of purchasing power that enabled families to buy specific material and food instead of investing the time and manual labor to grow and harvest it themselves. While traditional healers used to treat ailments and maladies in exchange for fish, meat or produce, these same treatments are now being paid for in cash. As another example of money affecting the traditional Guna practices; a synthetic polymer purchased from the Colombians has replaced the forest-sourced vines once exclusively used in the construction of their
homes. “It is not as good quality, but much easier to buy it then trek three days into the monte to find the right tree” (Victoriano, Interview).

To the lament of village elders, this phenomenon has become increasingly popular and entrenched with the newer generations. This purchasing power has gone on to attack the very fundamentals of what the Guna consider important values towards a fulfilled live. As families gradually came to see the traders and small stores as their “providers”, there was a growing disinterest in the hard work required to provide for their families by working the land. As the land and its resources were created by “Bab Dumad” (mother earth) for the sole benefit of the Guna, the hard work of a subsistence lifestyle is intricately linked to their cultural and cosmological belief system. “New generations are losing the motivation to wake up at four in the morning, paddle across to the mainland, work and come back with food for their family” (Adames, Interview).

On top of this, other sources pointed out the fact that men could be seen walking around the community in the mornings. Just 20 years ago, this was inconceivable as all the men, young and old, would be out in the “monte” (mountains where fincas are located) from 4 am to 1 pm tending to their fincas.

As families have increasingly started purchasing their food and embraced modern palates, this is the start of a common trend across similar Pacific island nations (Banuri, 2010). As they modernize and become wealthier, families increasingly incorporate processed sugars and foods into their diets. With canned and processed foods growing in prevalence within local diets, village elders remark on the impact it is having on their children. “Food from Panama doesn’t have vitamins” -Panama being a reference to anything from the “outside” (Inanbayiga, Interview). “It is harvested early and so no
nutrients” (Alonso, Interview). “Kids are malnourished and not strong” (Nunez, Interview). “These processed foods are what people eat now and why they are lazy” (Adames, Interview). By remarking on their “laziness”, this was a clear nudge to the perceived lack of interest in traditional Guna traditions and livelihoods. Somebody who is lazy is an “anti-sociale”, an individual not working towards the collective interest of the community. “These individuals have no place in Guna communities and represent everything that is wrong with the youth of today” (Gonzalo, Interview).

While the different Guna communities throughout the archipelago have modernized and embraced these changes at different rates, the accessibility and pervasiveness of processed food is consistent. As communities have gradually started to supplement their diets with processed and packaged foods, so has the community waste stream changed to reflect those developments. While the waste stream used to be exclusively organic and biodegradable waste discarded into coastal waters, it has changed to become inundated with modern products and materials. Supplemented by these synthetic materials, plastic bottles, wrappers, containers, bags, batteries, food cans have grown in prevalence. With this acculturation far outpacing the capacity of the waste-management infrastructure, there is a growing public health and ecological catastrophe. The exact proportions of the composition of waste are not well understood at this time. A comprehensive waste-audit would need to be conducted to get a far more complete picture.

3.2 Present Day Waste Management Practices

Solid Waste Management is a complex practice involving many different social groups and individuals within the socio-political organization of Niadub. Even within this
small community of 1,300, there are many different mechanisms and accepted practices for the management of solid-waste. This next section will outline what this research discovered about the current SWM practices on the island of Niadub. I have delineated the scope of “current” as encompassing the last five years.

As my research was studying the concept of “waste management” within an indigenous community, it is important to first recognize that there may be fundamentally different perceptions and understandings of what “waste” and “management” actually mean. The scope of each could vary significantly from its applications in communities from different regions of the world. As such, in order to contextualize my findings within the socio-cultural norms and values of Niadub, I had to first deconstruct the meaning of the concepts of “waste” and “management” as applied within this indigenous knowledge system.

3.2.1. What is “Waste”? 

In Guna communities, “waste”, or “basura”, as it is generally referred to, is a by-product of daily life at the individual, family and community level. Basura is trash; everything that does not have a functional value anymore within their lives. Within Guna cosmology, every entity in their social-ecological system holds either negative or positive energy (Ouvaldo, Interview). Waste, as a by-product of daily activities, embodies negative energy and thus must be removed from the social domain (Ouvaldo, Interview). Old roofing palm fronds, fallen fruit and kitchen refuse fall under the collective association of basura along with plastic bottles, discarded batteries and candy wrappers.
The solid waste that is currently generated on Niadub has evolved to have a diverse composition. Although I did not have time to conduct a comprehensive waste audit, based on personal and situational observations I was able to get a general idea about the characterization of the community waste stream. Overall, about 60% is typically organic matter (kitchen waste, building materials, plant matter and detritus), with the rest being plastics, textiles, medical/clinical waste, batteries, aluminum cans, tin cans and glass bottles.

3.2.2. What is “Management”?

Although “Waste-Management” takes on a very costly and politically complicated association within developed nations, albeit technologically basic, it has a long history and complex social organization underlying it within Guna communities. The central objective behind “waste-management” is to collect and remove solid waste from within the community domain. This effort is primarily concentrated at the household level and then scaled up to include communal areas and the village as a public domain.

As mentioned previously, historically waste has been perceived as something that assumes negative energy once discarded. It is therefore imperative to “manage” waste effectively. According to Guna values, a household and its adjacent areas that are free of waste are indicative of an intact and healthy family unit. This perception also applies to the community as a collective entity. Guna elders in Niadub would often reference examples of “non-traditional” and “unpleasant” communities as those whose streets were littered with trash. As such, “management” is concerned with maintaining the cleanliness
and aesthetic “wholeness” and value of a household or community. Stakeholders are concerned and actively involved with the collection and removal of waste from the private and public domain of Niadub. This concern for the personal and collective social wellbeing is the driving motivator behind SWM in Niadub.

3.2.3. Characterization of the Community Waste Stream

With a clear understanding of the implications and cultural significance of these terms, their application to the present village dynamics and waste management practices can now be fully understood. Within the objectives of this research, it was important to study and understand the characteristics of every step in the waste stream, from source to disposal. In this first section, I present my results from a rapid SWM assessment conducted in June of 2014.

Through personal observations and interviews, I was able to characterize the different variables of current SWM in the community of Niadub. Below are the four categorical locations around Niadub where solid waste is being produced as well as the types of waste generated in each location.
### Spatial Characterization

<table>
<thead>
<tr>
<th>Location</th>
<th>Type of waste</th>
<th>Disposal method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>• Biodegradable</td>
<td>• Shoreline Dumping</td>
</tr>
<tr>
<td></td>
<td>• Plastic</td>
<td>• Burn Piles</td>
</tr>
<tr>
<td></td>
<td>• Aluminum</td>
<td>• Using SW as landfill</td>
</tr>
<tr>
<td></td>
<td>• Tin</td>
<td>• Recycling</td>
</tr>
<tr>
<td>Health Clinic</td>
<td>• Medical</td>
<td>• Burn piles</td>
</tr>
<tr>
<td>Small Businesses</td>
<td>• Plastic</td>
<td>• Shoreline Dumping</td>
</tr>
<tr>
<td></td>
<td>• Paper</td>
<td>• Recycling</td>
</tr>
<tr>
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<td>• Plastic</td>
<td>• Shoreline Dumping</td>
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<tr>
<td></td>
<td>• Paper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Aluminum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Glass</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Characterization of waste categories and disposal methods

**Household**

“A” household can consist of multiple buildings, but represent the living space of one family unit. What delineates the household is the private space belonging to one family unit whose management responsibilities fall on the women of that particular household. While many households are directly adjacent to the water, most are in the second or third row of houses away from the water. Most of the houses on Niadub are still barren-earth thatched huts, although some wealthier families have started using concrete for the foundation and walls, with corrugated sheet metal for the roofs. While many Guna families have a separate cooking area/hut, others have incorporated it into the main living hut.
Health Clinic

The clinic is on the island of Niadub, which is connected to the island of Tikantiki by a bridge. It is the only building on the island as the presence of snakes and mythical stories have made this an undesired place to live (Robinson, Interview). The clinic is situated between the channel and a mangrove area on the southeast side of the island. The clinic is open six days a week, under the supervision and management of the community health workers.

Small businesses

These have become an integral part of life in Niadub and can be found distributed throughout the village. The types of businesses include convenience stores, bakeries and gasoline dispensaries. While the latter sell bread and gasoline respectively, convenience stores sell a variety of goods, specializing in a range of products that they will consistently have in stock. This is anything from fresh produce, assorted canned foods, candy, canned & bottled drinks, school supplies, textiles, plastic containers and metal tools.

Community Dock

A development project sponsored by the central government, the community dock has an administrative office, community store and loading area. While comprised of three separate functional areas, the community refers to them under the general umbrella of “muelle“ (dock). As a communal area under the management of the Congreso, with significant contributions to the waste stream, it shall be considered as one spatial area within the scope of this study.
As the dock is a communal area overseen by the Congreso, they have an administrative office and small store. The administrative office is responsible for taxing visitors and trade ships, as well as managing the sale of tickets for the community-owned transport boat. The store sells fewer items than other stores, primarily sodas, beer, bottled water, chips and cookies. As a gathering place where many men come to socialize, these items are typically consumed and discarded on the spot.

At the loading area, some trading ships will stage a market place of sorts, where they display the assorted goods that they in store. Items like toothpaste, shampoo, candy, cookies etc. are all individually wrapped in bulk packages. A significant amount of plastic packaging is left behind at the dock at the end of this event that happens whenever one of the larger trading vessels docks at the island.

3.2.4. Waste Management Strategies of Niadub

As shown in table 4 above, there are four main waste disposal methods that have and continue to be used in the community; dumping at the shoreline, burn piles, using solid waste as fill material and recycling. Figure 3 below depicts the waste stream of Niadub, from source to disposal (L to R).
As waste is generated in the four locations described above (A), it moves through the waste stream, eventually being recycled (B) or disposed (C).

**Recycling**

With select waste materials, recycling has become embedded within the community norms surrounding waste management. Colombian and Panamanian traders will buy crushed aluminum cans back from the Guna. As such, many men, women and children actively collect and store cans separately from the main waste stream to earn a little disposable income. They earn about US $0.25/lb or $2.00 for a full burlap sack of cans (Kibya, *Interview*). These transactions occur directly between individual family members and traders at the dock, where the Guna are given cash in return for the cans. The aluminum is then re-sold by the traders in the ports of Turbo, Colombia and Colon, Panama. While this practice is firmly embedded within the community, all families do
not necessarily participate. Some children will collect cans lying around the community for their families or anyone willing to offer them cookies (Kibya, Interview).

With specific sodas sold in 75ml glass bottles, the individual storeowners also recycle these. When families or children purchase a soda, they either exchange an empty bottle with the shopkeeper or pay a $0.05 deposit. When re-stocking their supplies with the traders, storeowners will exchange crates of empty glass bottles for new ones. Similar to aluminum cans, these get returned to middlemen in Turbo and Colon.

Select families also separate organic and food waste to be used as feed for their pigs. The recycling of biodegradable waste as pig feed is only practiced by around 10 families who currently own a pig.

**Shoreline dumping**

Waste is swept together with a hand brush of dried branches, collected in a makeshift bin (usually old plastic buckets or containers), brought to the closest shoreline and dumped on the beach or directly into the ocean. Families whose property abuts the shoreline typically dump their waste directly into the water or at the edge of their property where it meets the water. Families whose property does not lie adjacent to the water use a friendly neighbors’ access or one of several communal beach or water access points and dump their waste there. Children will use any accessible entry points to the shoreline to dispose of their waste.

**Burn Piles**

Certain families collect their SW, dispose of it in a habitual location somewhere in the village and incinerate everything. This practice is common with individual households, along the southern shoreline and in the mangrove area behind the community health
Personal observations yielded no conclusive attempts to differentiate or separate waste that was to be burned. As evidenced, soda cans could also be found in burn piles along with glass and other non-flammable materials.

Fill material
With the filling in of the shoreline a well-established method for increasing island surface area, SW is now also used by some as raw material in this practice. Alternating layers of rock, coral rubble and sand with SW, a small island has gradually been filled over the last 13 years from the seabed up. The filling in of this island that lies behind Niadub is an individual effort by one man on his families’ land. Several other families in the community also employ this method when filling in the shoreline directly adjacent to their homes.

3.3. Community Interest Groups Involved in Solid Waste Management

The previous section outlined where in the community waste was being generated and what the established disposal practices were. This next section will provide an overview of the interest groups involved in the collection and disposal of that solid-waste, as well as the regulation of solid-waste management within Niadub.

3.3.1. Waste Collectors

These interest groups are arguably the most important social group involved along the waste stream. As collectors of an output, they are arguably the most important actors whose practices, perceptions and needs must be incorporated in the planning of a solid waste management framework.
- Women
- Comité de Limpieza
- Health workers

**Women**

Women play the most active and important role within the current Waste Management framework in the community. As has traditionally been advocated by the village chiefs, women are expected to sweep in and around their houses three times per day: once in the morning, once at midday and again in the evening.

In this way they keep their homes, floors, patios and streets clean and clear of *basura* (leaves, plastic, food waste). As the Guna are matrilocal societies, the women do this under the umbrella of their personal responsibility as heads of the household. Every woman is expected to fulfill this role under the social standards and values of the community. There are formal/informal rules and social agreements that govern this practice that will be highlighted when discussing the actors involved in the regulation of SWM.

**Comité de Limpieza**

The Comité de Limpieza (committee of cleaning) is one of several sub-committees within the socio-political organization of the Congreso. As administrative arms of the village decision-making body, they address a portfolio of social programs, covering everything from sports to communal labor to the maintenance of public spaces within the community. The Comité de Limpieza is responsible for keeping the public spaces and communal buildings of the community well maintained and free from garbage. It has an administrative board composed of male secretaries, who in turn...
delegate work assignments to their female counterparts to mobilize the women’s work groups. The women are organized into work groups that divide up the community into twelve different groups (Gonzalo, Interview).

Under that umbrella of responsibility, it has the women assigned to a rotating work schedule. In this way, a couple times a week different working groups are alternatively responsible for cleaning in and around the Congreso building, the school, dock and the streets. While the clean up of trash has come to be a fundamental role of this Committee, the maintenance of community spaces also entails cutting back weeds and long grass along the central streets and paths.

Health Workers

The health workers manage another significant source of SW contributing to the community waste stream. The community health workers are based at the clinic and are responsible for the collection and disposal of the SW produced there. As a rural health clinic with minimal resources, the SW is generally comprised of medicinal packaging, bandages, glass vials, broken tools and expired medicines. Waste is collected in one of several bins in the clinic and then routinely disposed of on top of pre-existing burn piles in the mangrove area behind the clinic. Once set alight, these burn piles are left to burn unsupervised. This location often also lies upwind of the community, leading the putrid and toxic smoke to get blown in the direction of the households along the South-Eastern shore. Several small to medium burn piles were found in a 100 sq. m area at the mangrove site, indicating that there is not one specifically designated location for this
practice. Once incinerated, the burn piles are left exposed to the elements and tidal fluctuations that occasionally flood the area, as evidenced by the soft marshy texture of the soil.

3.3.2. Waste Recyclers

In the community of Niadub, my research found recycling to be a well-established practice amongst several actors. As a market driven activity, recycling in Niadub only encompasses a select few classes of waste. These either have value in the urban recycling sector to which the community is connected or are reused and repurposed within the community.

- Shopkeepers
- Traders
- Free Agents

**Shopkeepers**

As mentioned in the previous section, there are several small businesses in the community. While some sell bread or gasoline, it is the small convenience store shopkeepers who deal in the most diverse selection of products. As distributors of glass-bottle beverages, these shopkeepers play an important role in removing this SW from the waste stream through recycling. With the cost of the bottles absorbed in the price of a crate of soda, the shopkeepers are incentivized to collect and return every bottle.

The shop owners supply their products from the traders on credit, paying them upon their return to Niadub. In this way, the responsibility of returning the glass bottles is upon the shopkeeper and the traders do not assume the financial risk. This cost is then
relayed down to the consumer. When buying sodas, shop owners present their consumers with two options. 1. They exchange an empty bottle for the new one and only pay the cost of the beverage. 2. They levy a $0.05 tax upon the individual that will cover the cost of the bottle in the case that it is never returned. A full crate of glass beverages is then returned to the traders when re-stocking their supplies.

**Traders**

Recycling is a market-based activity that would not establish itself without a demand for those products in the first place. Coming from Colon, Panama or Turbo, Colombia, the traders are the backbone to the recycling sector in Niadub and throughout San Blas. Acting as the middlemen between Guna communities and recycling facilities, the traders are connecting Niadub to markets they would otherwise not have access to due to their geographical isolation. While they primarily sell products in the Guna communities, they increase the profitability of their return journey by buying coconuts and recyclable items back from the Guna. Currently, aluminum beverage cans and glass bottles are the only items that the traders have a market for.

Long before the traders arrive at the village dock, the villagers are alerted to their presence by the sound of their rumbling engines coming along the coast. Once the traders are secured to the dock, they “open up shop” and allow the community members to come to them with their recyclables.

**Free Agents**

Within recycling, free agents also play an important role in terms of differentiating and separating recyclable materials from the waste stream. Individual families actively participate in this sector by collecting aluminum cans for resale to the
traders passing through the Comarca. I categorize them as “free agents” because this practice is not common across all households, there is no collaboration or organization amongst the different families and they act on their own accord.

As the canned beverages get consumed, they are generally discarded on the ground somewhere in the household and then periodically gathered, crushed and stored in a burlap sack. When sweeping the household of these active recyclers, the women know not to discard the cans along with the rest of the SW. These are then brought to the traders where individuals get $0.25 - $0.30 /lb, which equates to about 40 cans.

Although few in numbers, some families are also prosperous enough to own a pig. As a result, beyond the standard household waste collection, these individual family units are also actively engaged in another aspect of SWM. The differentiation of SW allows individual materials to be recovered for reuse or recycling purposes. Separating organic and food waste from the central waste stream is a common practice to recover waste for pig feed. This is only done at the individual household level and there have been no attempts by these actors to collect organic waste from neighbors.

3.3.3. Waste Management Regulators

Within the scope of SWM in Niadub, I define “regulators” as those actors who through their actions and interactions with the community, influence and shape the existing SWM framework. These actors are not involved in the day-day management of SW, but are working to address the symptoms, underlying causes of current SWM practices and community awareness.
- Congreso
- Balu Uala
- Public health Ministry
- UM researchers

Figure 4 below is a map of the Niadub waste stream as depicted in Figure 3, depicting the different interest groups and their involvement in the regulation of the collection, recycling or disposal of solid waste within the village. The Congreso and its influence are depicted in red, while health affiliated efforts are depicted in blue and environmental efforts depicted in green. The individual roles and varying levels of influence are described in further detail below, with Figure 4 serving as a visual roadmap.

Figure 4. Interest groups involvement in the regulation of SWM
**Congreso**

In traditional Guna communities, the Congreso is the social, political and religious institution that has oversight over community affairs. There are typically anywhere from five to seven “sahilas” (chiefs) at any one time, with a sub-hierarchy amongst them. The Congreso gathering is an exclusively male assembly, required for all adult males five nights a week. Evening Congreso is a socio-political forum for community matters, discussing current affairs and developments that may affect the community. As a participatory and egalitarian political framework, individuals are allowed to bring up any issue in Congreso to the sahilas and assembled community.

As the problem of litter has grown incrementally with modernization and changing diets, so has the pressure on the community socio-political system to address it. If there is an especially blighted area of the island, a concerned or irritated individual will bring this to the attention of the community leaders in the evening Congreso. The Congreso then mandates that the Comite de Limpieza address a particular site in its clean-up efforts (arrow X2). Be it an abandoned house, particular street or communal area of the village.

When several children had recently cut their feet on rusting food cans that had been carelessly disposed of along the shoreline, frustrated parents brought this up in Congreso. As a result, the sahilas spoke on the issue and mandated (arrow X1) that families paddle out beyond the beach to dispose of these food cans in the water, beyond the reach of playing children. Similarly, the sahilas will frequently remind the women of their duty to sweep in and around their homes (arrow X1).
Balu Uala

As a non-profit working for the conservation and sustainable use of marine resources in Guna Yala, Balu Uala has recently come to address the issue of SWM and trash pollution. According to its local promoters, to combat this growing problem, Balu Uala organizes monthly clean-ups to address the discarded waste piling up in communal areas around the community and along the shoreline (arrow Y1). In planning the clean-ups, Balu Uala works with the school to include children in the process and raise awareness about the growing pollution problem. The collected waste is then brought to the mainland by boat to be incinerated in a burn-pile. These cleanups have also been organized in collaboration (arrow Y2) with University of Miami student groups when they come to the island motivated to address the issue of trash pollution.

As part of their efforts to address Waste Management within the community, Balu Uala also spearheaded an effort to install rubbish bins at several locations throughout the community. Designed to collect non-biodegradable waste, they were strategically placed (arrow Y1) at six key sites around the community where people disposed of their waste. Accompanied with small informational signs, Balu Uala attempts to collect non-organic SW before it was disposed of on the ground or in the water.

Ministry of Public Health

The Panamanian Ministry of Public Health has filled an important function in raising awareness and educating the community about the role that trash can play in the propagation of mosquitoes. It has several campaigns and public health workers who spearhead efforts to prevent the proliferation of vector-borne diseases in rural communities. With increasing cases of Dengue fever and Malaria throughout the
Comarca, the Ministry of Public Health sent public health workers to Guna communities in February of 2014. This effort was spearheaded in conjunction with the University of Miami of faculty and public health specialist. Going through each individual household in Niadub, the health worker identify potential standing water vessels and explain to families how that would support breeding mosquito’s. Trash littering the community and shoreline was also a focus of their attention and concern as trash easily catches rainwater. Health workers made a big point about removing trash from the vicinity of their homes (arrow Z1) and within the community, to help combat the spread of Dengue and Malaria.

**University of Miami Researchers**

Several University of Miami (UM) faculty members and students have traveled to Niadub over the last three decades for research projects or field/service-based courses. While not active members of the community, their presence and the purpose of their visits have played a noteworthy role in affecting the community perceptions of solid waste-management. This group is therefore an important outside actor whose actions have influenced the perceptions of community members and who must therefore be considered in this analysis.

As a Public Health specialist, the main UM faculty member who had led trips to Niadub has driven research and field courses that have focused on community well-being and public health issues afflicting the community of Niadub.

During my first field visit in March of 2013, students from a political ecology field course organized a clean up (arrow X2) to remove alkaline batteries that were polluting the shoreline and beaches. With the help of a large group of children, three
large trash bags of batteries were collected and later buried at a remote location on the mainland.

In June of 2014, a group of visiting public health students also led workshops and educational games about the importance of proper trash disposal. As trash provides mosquitoes the standing water that serves as breeding grounds, this became an integrated part of their workshops and message. This group of UM students also organized another clean up (arrow X2) with local children to help reinforce a holistic understanding of Dengue Fever and its causes.

3.4. Discussion Groups on Solid Waste Management

Three discussion groups were organized with the help of select community leaders. The groups were organized to target a specific interest group. While the number of participants varied, this was disregarded as an important variable to control, as it was more important that the groups were represented by their regular participating members, rather than standardizing the number of participants. This ensured that the group dynamic was as similar to how it would be in daily life.

<table>
<thead>
<tr>
<th>Discussion Group</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congreso</td>
<td>24</td>
</tr>
<tr>
<td>Women from Comite de Limpieza</td>
<td>14</td>
</tr>
<tr>
<td>Balu Uala</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 5. Number of discussion group participants

This Congreso discussion group was on one of the evenings that it was not mandatory for all the men in the village. While this may seem counter-productive, it was actually the opposite. This meant that those present were active participating members of
the decision-making process, either chiefs, committee secretaries, financial secretaries, traditional healers or engaged community individuals.

In the women’s discussion group, the conversation was initially dominated by the strong personality of the community health worker. Initially, conversation focused heavily on public health related issues. Eventually, as the other women became more comfortable in the dynamic, they became increasingly vocal and active contributors to the discussion.

With Balu Uala there was a similar result at first, where the lead promoter primarily dominated the discussion. The other members initially deflected all questions to him, their natural leader. Eventually, with encouragement and probing questions, the other members increasingly chimed in with their own opinions, resulting in a productive collective discussion.

The summarized results of the three discussion groups are displayed in Table 6 below. The discussions and individual comments were compiled into a spreadsheet and then organized into overarching themes, which are displayed below. Each bullet point represents a comment that was discussed at length and agreed upon by the group as an important component within that question topic. These results are discussed in further depth below.
Table 6. Key themes discussed during the discussion groups

<table>
<thead>
<tr>
<th>Assessment of current WM</th>
<th>Congreso</th>
<th>Women’s Group</th>
<th>Balu Uala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Pollution</td>
<td>Littering</td>
<td>Waste classification</td>
<td></td>
</tr>
<tr>
<td>Capitalism</td>
<td>Negative Image</td>
<td>Freeloading &amp; theft</td>
<td></td>
</tr>
<tr>
<td>Foreign concern</td>
<td>Comité Absent</td>
<td>Disinterest</td>
<td></td>
</tr>
<tr>
<td>Outside organizations</td>
<td>Individuality</td>
<td>Modern diets</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact of current WM on P, E, H</th>
<th>Congreso</th>
<th>Women’s Group</th>
<th>Balu Uala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue Fever</td>
<td>Dengue Fever</td>
<td>Dengue Fever</td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td>Malaria</td>
<td>Malaria</td>
<td></td>
</tr>
<tr>
<td>Hazard to children</td>
<td>Hazard to children</td>
<td>Rat infestation</td>
<td></td>
</tr>
<tr>
<td>Community integrity</td>
<td></td>
<td>Hazard to children</td>
<td></td>
</tr>
<tr>
<td>Marine Debris</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathway for sustainable WM</th>
<th>Congreso</th>
<th>Women’s Group</th>
<th>Balu Uala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duwangabili</td>
<td>Communication &amp; Awareness</td>
<td>Collection bins</td>
<td></td>
</tr>
<tr>
<td>Congreso Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Funding</td>
<td></td>
<td></td>
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<tr>
<td>Landfill</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remove &amp; Burn</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Organic composting</td>
<td></td>
</tr>
</tbody>
</table>

3.4.1. Assessment of Current Waste Management

**Congreso**

As the discussion started by reflecting on current SWM practices, words like “petrochimico”, “synthetico”, and “plastico” were used repeatedly when referring to non-biodegradable waste. They differentiated between “natural” Guna waste, and “foreign/outsider” waste, referencing the pollution of urban centers like Panama City, as the antithesis of what Guna villages should work towards. In terms of the management of these wastes and the different community actors involved, there was a very negative perception of Balu Uala and their projects. It was clear this organization was considered an outsider and their participation in congreso was minimal, if any at all. Many wondered why they should be talking about waste management if the Balu Uala promoters were
getting paid to organize clean-ups around the community. They spoke about waste management as the concern of foreigners.

Women

As the principal actors involved in the management of solid-waste in Niadub, the women were very preoccupied with the lack of stewardship shown by the rest of the community. There was clear frustration at the perceived disinterest by men and children to keep the community clean and free of litter. The reputation and image of the community was being tainted as a result and that was complemented by the general decline of social values. As the ones responsible for community maintenance, the task of cleaning up garbage fell upon them, which was one of the problems. Some women mentioned that there was an increasing tendency for individuality and selfishness within the community, citing neighborly disputes over proper waste disposal as an example. When one confronted her neighbor about the danger of dumping her trash in the grass nearby, she was scolded and told to mind her own business, even though anybody’s child could hurt themselves on it.

Balu Uala

Despite being an environmental organization, the members did not display extreme frustration or concern with current waste-management practices. The concept of waste-management had almost become a sore subject for this group, as all of their initiatives were arguably unsuccessful in their applications within the community. Earlier attempts at installing garbage bins resulted in the bins and bags being stolen. Some remarked that they felt the community saw Balu Uala as a charity, occasionally providing free goods, less like a partner to the community. As a result of their shortcomings, there
was a general air of indifference in regards to waste-management within the community. As they saw the modernization of diets as the primary contributor to increased waste production on the island, due to the unlikelihood of this to change, there did not seem to be a lot of inspiration. The main promoter remarked that if the community wanted to pursue it, and they asked for Balu Uala’s assistance, they would provide help where they could, but they were not going to be taking any more initiatives on that front.

3.4.2. Impact of Current Waste Management on Population, Health and Environment

Congreso

Generally speaking, Congreso members expressed great fixation with the levels of litter throughout the community. Rooted in concerns for the holistic wellbeing of the community, there was an expressed frustration at the inability to completely eradicate waste from within the community domain. It was not only a clear eyesore, indicative of the modernization prevalent everywhere; the lack of success in tackling this problem was another sign of how Guna traditions and values were being lost. The issue was also intricately linked to the presence of Dengue fever and Malaria. They mentioned the deaths that had already occurred in the Comarca, and how that was something that had to be avoided on their own island. They stressed the urgency of ensuring that garbage was thrown properly in the ocean, not leaving anything to reside on the island. This would also protect the children, many of whom had recently been cutting their feet on improperly discarded garbage. Their concern about waste and its impact on the livelihoods of the community did not extend beyond the boundaries of Niadub.
Women

Their concern about the issue of waste-management was heavily grounded in their concern for the safety and health of their children. Dengue Fever was on everybody’s minds and thus many mentioned they were extra careful to dispose of waste *in* the water, not along the shoreline. The solid waste management framework was therefore effective in their eyes; it just required greater collective mobilization on the behalf of other community actors to keep the community clean. Having everybody conscious of this, and participate in efforts to keep the community clean would protect their island from Dengue and Malaria and also their children from hazardous material.

Balu Uala

Balu Uala members used the examples of recent Dengue Fever deaths in the Comarca as a reason why it was so important to be addressing waste management at the village level. They specified how the link between garbage and those diseases was known and expressed their frustration at how even armed with this knowledge; there was a lack of action of behalf of the Congreso. Furthermore, the lead promoter used his own property as an example of how garbage along the shoreline also contributed to the rat infestation on the island. Several ran by during the course of our discussion, each time pointed out and emphasized with a large rock thrown in their general direction.

3.4.3. Pathway for Sustainable Waste Management

Congreso

Building on the discussion, the Congreso became very animated about potential pathways for sustainable waste management. In highlighting the need for an integrated
approach to waste management, several members mentioned the cultural concept of “Duwangabili”, a “trash cemetery”. A designated place to help remove waste and negative energy from the community realm and support its reintegration into the cyclical processes of nature. They stressed that this concept of waste management had already been designed by their ancestor’s centuries ago, it just needed to be applied to the modern context. Building on that, others mentioned the idea of creating a landfill in the mangrove area behind the health clinic, an idea that had apparently been tossed around before. With the Congreso organizing and holding oversight over administrative affairs, they could approach foreign organizations and funders for the necessary financial assistance. Organizations like Balu Uala and larger international development organizations were mentioned as potential backers. This stemmed from the fact that the International Development Bank funded a pilot recycling program in four communities in the far west of the Comarca. The idea of foreign funding was immediately injected into the discussion, without any regard to local financing mechanisms.

Women

In the discussion about future pathways for waste management, the women were primarily concerned with engaging with the entire community of Niadub. Building on their perceived lack of involvement of others in addressing the problem, they stressed the importance of communication and awareness strategies to fix waste management. By engaging with other interest groups of the community, and discussing the topic frequently in Congreso, they felt tangible progress could be achieved. As a perceived minority within the scope of this issue, they wanted to include others in the dialogue. One woman
also put forth the idea of engaging with neighboring communities, to identify potential strategies that had worked elsewhere and exchange resources and knowledge.

**Balu Uala**

The members of Balu Uala were highly intent on following through with some of the initial strategies that they had developed and implemented in the past. The suggested approach was to continue with the establishment of collection bins at strategic locations around the community. This garbage could then periodically collected, removed from the island, brought to the mainland and burned. This followed the already proven approach that Balu Uala supposedly used with their monthly cleanups. Everybody agreed that this was currently the most feasible strategy, but did not go into any depth as to who would provide the financing for such an endeavor. Neither did anybody mention how this might overlap with the administrative oversight and responsibility of the Congreso. They did not explore any potential mechanisms for collaboration with the Congreso. Furthermore, the members of Balu Uala strongly emphasized the unexplored potential for organic composting. By removing all organic waste from the waste stream, that resource could be converted into compost and then used for their agricultural exploits. While some of the present members mentioned they already did this for themselves, how this would be scaled up at the community level was not explored.
CHAPTER 4: Analysis and Discussion

4.1. Historical Waste Management

With population growth, urban migration and the commercialization of the lobster fishery (Hoehn, 2009), Niadub has been confronted with waves of transformative change. This has had a fundamental impact on the traditional practices and wellbeing of the community as well as the composition, production and management of solid-waste.

As described in results section 3.1, the concept of waste management has always been ingrained into their traditional belief system and community practices. This has made the concept of WM something the community understands and practices on a daily basis, albeit fundamentally different from WM in Panama City. Besides serving the practical purpose of promoting sanitary living conditions, it also fits within Guna cosmology and their cyclical perception of their relationship with mother earth. As many respondents explained, this concept of waste management has been well established within their cultural and cosmological beliefs since their creation.

However, what my results have shown is that the very essence that supported integrated solid waste management has begun to dissipate as modern practices and values have come to value a consumer culture. Niadub’s increasing connection to urban markets and trade routes have supported the diffusion of foreign ideas and capitalist values that have entrenched themselves within the youth. Contributing to the loss of cultural norms and a growing trash pollution problem.

It is these transcendental changes in Guna values and livelihoods over the last half decade that has led to the pervasive problem of trash pollution in Niadub and
throughout the Comarca. The need for an integrated solid waste management framework is in response to the increasingly consumptive lifestyles of communities.

4.2. Local vs. Foreign; Efforts to Address Waste Management

As described in section 3.3, the issue of waste-management has birthed many individual responses. While each and every initiative is vested in the best interests of the community, the fragmented approach has polarized many community groups and created tension within Niadub. With little collaboration and sharing of economic and social resources amongst these different outside groups, there has been little initiative on behalf of the congreso itself to address this problem.

Balu Uala has been hard-pressed to gain traction in their targeted waste-management efforts. Preceded by the negative and culturally insensitive reputation of its American director, this “community-based” organization has been tainted in the eyes of the Guna.

Even though they work through local community promoters, this organization has been marginalized due to its foreign-driven agenda and lack of community involvement in their decision-making. As a socio-political society that functions through a transparent, egalitarian and democratic decision-making Congreso, Balu Uala’s hierarchy and western system of administration is culturally inappropriate. Although not explicitly stated, I believe community leaders see Balu Uala’s efforts as a challenge to their authority and effective leadership. Balu Uala’s activities are attempts to address perceived problems throughout the village. Issues that a small minority group of individuals, who the Congreso believe to be profiting financially, has taken it upon themselves to solve. Their
community clean-up efforts have been abandoned, their trash bins stolen and their promoters stigmatized and ignored. Symbolic of their shortcomings, a sign Balu Uala had made delineating the boundary of a local marine protected area is now being used as a bathroom door. As an added insult, this bathroom is immediately adjacent to the home of the main Balu Uala promoter.

Furthermore, the Congreso discussion groups shows that many of their efforts have actually had the opposite desired impact. Rather than inspiring environmental stewardship and sustainable practices amongst the community, environmental issues have become perceived as “the western-man’s burden” (Oualdo, Interview). This makes it highly unlikely that the environmental impacts of current waste management practices could become a driving motivator.

To further exacerbate this situation, University of Miami field courses have added to the growing disconnect between the community and foreigners. Although well intentioned, many of their efforts actually contribute to the negative perceptions that some individuals in Niadub have of foreign researchers, specifically the University of Miami student groups. Many informants expressed their contempt at the attempts by University of Miami students to organize trash cleanups in the community or educational workshops about litter and Dengue Fever. Although an exciting activity for the children to be involved in, these initiatives are one-time efforts that many see as futile.

Furthermore, I believe this contributes to the notion of environmental initiatives as “foreign interests”, further alienating the Guna from taking up this cause themselves. One informant expressed his frustration at the fact that University of Miami faculty have been coming to Niadub for almost 30 years, have built their reputations and career upon their
research here, and the tangible benefits to the community are few and far between. While this is debatable, the underlying issue is one of well-intentioned foreign students and researchers working in communities without a thorough understanding of local perceptions, needs and concerns. In so far as addressing waste-management, their impact has been limited and superficial at most. As the Guna see it, although littering is a problem, their current waste-management system works effectively and serves the communities’ needs and interests.

4.3. Population, Health and Environment Concerns About Waste Management

While there have been various local and international initiatives to address waste management in the community of Niadub, ultimately the only successful one will be driven by local decision making bodies, inspired by the needs and concerns of the community. In Niadub, socio-cultural norms actually valorize efficient waste-management and a litter-free community, and these are concepts various interest groups are actively working to promote. Unfortunately with the current levels of plastic and non-biodegradable waste, these practices have had a great impact on public health and the local ecosystem. As the scale of this issue has grown, community awareness has as well.

As the results of my discussion groups demonstrated, there is great concern amongst members of the Congreso, Balu Uala and women of the community about the scale and severity of the problem. The concern and motivation of community interest groups to address waste management is rooted in two factors:

1. Public Health concerns related to Dengue Fever, Malaria and children injuring themselves on garbage
2. Maintaining the social and cultural wellbeing of the community

As Dengue Fever and malaria have spread throughout the Comarca, community members in Niadub have become well aware of the perils. With information coming through the community health workers, Ministry of Public Health field workers and a UM professor, this topic has been pushed to the forefront of community concerns. It is actively discussed in Congreso, the health clinic and households. With these mosquito borne diseases threatening the collective wellbeing of the community, all major community actors have become engaged in efforts to stymie their proliferation. This collective mobilization is the communities’ social capital at work. A manifestation of the social strengths and community linkages capable of combating a public health epidemic. While trash certainly is not the only vector for these diseases to spread, it has become an important component of targeted efforts. Its presence on the streets and shoreline of Niadub has prompted a new wave of attention to solid waste-management.

Furthermore, concern about the problem has become magnified, as there has been a recent spate of injuries to children cutting their feet on improperly disposed of garbage. To the sahilas, this pollution is an indicator of deteriorating social values and cultural disengagement by the youth (Ouvaldo, Interview). To others, it represents a lack of community cohesiveness and diminishing desire for collective wellbeing. Regardless, to the community as a whole, it represents the public health impacts of trash pollution on the island.

Preceding the arrival of Dengue and Malaria, trash had only ever been addressed at that level when it affected the cleanliness and image of the community. The accumulation of trash can happen quite quickly, with the rate at which local kids
consume sodas, sweets, cookies and chips. As a culture that valorizes clean households and communities, litter lying in and around the streets is very negatively perceived. Many referenced pollution as a problem of the city, or Nargana, a notoriously polluted, modernized and un-traditional community. Niadub leaders and elders are concerned with maintaining their traditional heritage and the reputation of their community amongst Guna throughout the Comarca. In that respect, litter presents a challenge to their authority, cultural heritage and traditional reputation of the community.

Environmental concerns about current trash pollution were rarely cited as principal motivators in the struggle to address waste-management. Although two members of Balu Uala mentioned the impacts of marine debris, within the community, the environmental impacts are too far removed to function as important motivators. On the contrary, when solid-waste is thoroughly collected and disposed of directly into the ocean, it is actually considered “successful waste-management”. When everybody works together to keep the community clean and the social mechanisms for accountability are in place and functioning, there isn’t a problem. Trash and its associated negative energy is removed from the community domain, the streets are clean and the community well maintained and proper. The public health threat is mitigated and the community can let its concerns and garbage be washed away with the tide.

4.4. Limitations

This study was however not without its limitations. Limited funding is the limiting factor on the temporal extent of my fieldwork. In order to gain a holistic and comprehensive understanding of the social and political processes of Niadub, some
academics would contend that this type of investigation could not be done in less than a couple months. I argue however, that the small, dense nature of the community, combined with my valuable key informants allowed for a high degree of insight and access. A comprehensive literature review combined with extensive pre-departure discussion and consultation with select individuals from Niadub helped establish a sound foundation upon which my research was developed.

Furthermore, another challenge to working in Niadub is my lack of understanding of Tule, the Guna language. Although not critical, it prevented me from interpreting the Congreso events and happenings firsthand. To surmount this challenge, I had to rely on key informants to relay the important themes and messages from the Congreso meetings. While Spanish is the primary language taught in schools, for most, Tule is still their primary language. Interviews and discussion groups were conducted in Spanish, but therefore sometimes required translation into Tule. Information may have been lost or misinterpreted during this process.

Finally, in assessing the socio-cultural context of waste management, this single site study was limited in scope. Without the ability to conduct a multi-site analysis of socio-cultural norms and values, the findings from this research are confined to this island case study.
CHAPTER 5: Conclusion

Despite the limitations discussed above, this research has demonstrated the applicability of ethnography and political ecology towards building a greater understanding of the social context of waste management. Within this case study, the ethnographic methods and political ecology framework were highly valuable tools to understand socio-cultural norms and values. It also helped disentangle the different interest groups involved and their many collaborations and conflicts.

The level of information and insight into individuals’ perceptions and awareness was extremely valuable. Through empathic ethnography, I gained perspective into the cultural significance of trash, public perceptions of garbage and current waste-disposal practices. By approaching it from a political ecology perspective, it also elucidated the many different interest groups inextricably linked to waste management in this small island community.

Furthermore, given the distrust the community has for foreigners, the richness of the information that was collected within the course of this study is testament to the effectiveness of this approach. As a foreign researcher myself, I was nevertheless able to disentangle myself from the many negative perspectives and get insight into the community’s true perception of people from my background. Discussion groups encouraged true and honest dialogue, irrespective of my presence. This not only helped me understand existing conflicts and frustrations amongst interest groups, but also brought forth peoples’ true motivation for addressing waste management. As a conservationist, the waste-management problem was an environmental catastrophe. However my research showed that approaching the issue from an environmental
perspective would never be successful. The community’s concerns and needs were
grounded in aspects of public health and social wellbeing. Integrating those priorities into
an upgraded waste management plan would be much more effective and complementary
to the local socio-cultural context.

Within an integrated solid waste management planning process (United States
Environmental Protection Agency), such information is critical in order to address
community needs and concerns and build upon existing grassroots community efforts.
Without the kind of information gathered in this research, any conservation or
development planning risks alienating community interest groups through culturally
inappropriate methods and strategies. This case study effectively demonstrated how
ethnography and political ecology can be important components of the waste
management planning process.

Nevertheless, I stress the value and importance of making the research process as
participatory and collaborative as possible. The ethnographic and political ecology
approaches must be incorporated into a collaborative research design to encourage
maximum degrees of transparency. This participatory approach can help overcome many
of the limitations discussed above, as honesty and trust are valuable assets to gaining
insight into peoples’ true values and perceptions.

This case study on the island community of Niadub helps us understand how
cultural norms and traditional values can be used towards sustainable development.
Harnessing traditional knowledge towards inclusive development that reflects local
culture and matches the stated needs of local interest groups.
WORKS CITED


