

A photograph of a beach scene. In the foreground on the left, there is a tree with many bare, thin branches. The ground is sandy and littered with some trash, including a plastic bottle. In the background, the ocean waves are breaking on the shore under a cloudy sky.

# *Watering the Seed*

**A Model for Change in  
Jinotepe, Nicaragua and Beyond**

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# *Watering the Seed*

## A Model for Change in Jinotepe, Nicaragua and Beyond

by  
Andy Douglas

Senior Project  
City & Regional Planning Department  
California Polytechnic State University  
San Luis Obispo  
2012

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# Approval Page

**Title:** Watering the Seed: A Model for Change  
in Jinotepe, Nicaragua and Beyond

**Author:** Andy Douglas

**Date Submitted:** December 2012

**Adrienne Greve**  
Senior Project Advisor

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Hemalata C. Dandekar**  
Department Head

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

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# Introduction

## ~Introduction

This chapter will explain the focus and goals of this senior project and introduce the partnering nonprofit organization, Abran Los Ojos.



# Introduction

## *Focus*

The focus of this senior project is waste management in Nicaragua, particularly the City of Jinotepe. However, the inspiration for the project comes from the global issue of sustaining our planet for generations to come. “Although societies differ in their conceptualizations of sustainability, indefinite human survival on a global scale requires certain basic support systems, which can be maintained only with a healthy environment” (Brown et al., 1987, pg. 713). The overall health of the environment can begin to degrade when waste is not properly managed and pollution enters the natural environment. Although this is a global issue, progress must be realized at the local level.

This senior project was made possible only through close collaboration with the staff of the nonprofit organization Abran Los Ojos, based in Jinotepe. Since the project’s inception the goal has been to produce a final product that would both fulfill the Cal Poly senior project requirements as well as contribute to the efforts of Abran Los Ojos. The organization is directed by two Cal Poly alumni, Andrew Craig (City & Regional Planning), and Karen Douglas (Architecture). Much of the content in this document is derived from personal communications with Andrew and Karen. The vision and mission of Abran Los Ojos are stated below, as well as the goals of this document.

## *Vision*

Create an inspirational model of change that can simultaneously spread a broader consciousness of proper recycling, composting, and sustainable practices while developing a separation and collection infrastructure. We refer to our first pilot model as “The Seed,” emphasizing the point that it needs to be cared for by its community in order to survive in the future.

We begin this process in the City of Jinotepe and are gathering new partners every month as we develop a holistic waste management plan for the Municipality.



Figure 1: Abran Los Ojos (in the process of becoming a 501(c)(3) nonprofit organization)

# Introduction

## *Mission*

Spread a broader consciousness through the entire community of Jinotepe regarding proper waste management and the negative effects of pollution both in the built and natural environment. In accordance with this instilled understanding, foster a collaborative effort to bring about change through recycling and composting efforts that seek to reduce the waste stream and preserve the environment for generations to come.

## *Goals of this Document*

Examine the case study of Abran Los Ojos' first pilot project, "The Seed," assessing the process from planning through implementation.

Devise a maintenance plan for "The Seed" factoring in all foreseeable challenges and obstacles to ensure project continuity.

Identify lessons learned during this pilot project with the intention of fostering success in additional waste management projects within Nicaragua.

Demonstrate the potential effectiveness of this pilot-to-corporate model to encourage its use in the improvement of the status quo of any issue.



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# The Soil

## ~Background

This chapter will introduce the City of Jinotepe and present characteristics relevant to solid waste within the Municipality. The chapter will also include the waste management practices currently being performed by the Municipality as well as the practices of an informal recycling group called the Classifiers. This discussion of current practices will be essential to deriving opportunities for improvement.



# The Soil

## Jinotepe

Jinotepe is the Capital City of the Department of Carazo, which is similar to a state in the United States. It holds a population of approximately 45,000, while Carazo's population is about 166,000. The City is in the South Pacific region of Nicaragua, in the Driamba highlands. It lies along the Pan American Highway, connecting it to Managua, Nicaragua's capital city to the North, and Granada to the East. Jinotepe is roughly 20 miles from the Pacific Coast and rests at 569 meters (1,867 feet) above sea level ("Unicarao," 2012).

The City was founded in 1823 and has a rich history of Catholic and Christian influence. There is a strong presence of old and new cathedrals, churches and religious schools (Craig, 2012). The City has a healthy community atmosphere with people of all ages gathering at the park to socialize. It is a safe, quiet community and for many years was Nicaragua's cleanest city (Craig, 2012).

Jinotepe, along with the rest of Nicaragua, has a rich natural environment. As Winters (1964) has stated in "The Agricultural Economy of Nicaragua," the region experiences a wet and dry season each year. This coupled with the nutrient rich soil fosters an ideal environment for agriculture. The area surrounding Jinotepe produces coffee, sugarcane, rice, beans, corn, and various other crops. There are also limestone quarries, saltworks, and some lumbering operations in the area. Ecotourism is also a large contributor to the economic vitality of the whole of Nicaragua. All of these significant economic sectors are dependent upon the natural environment (Winters, 1964).

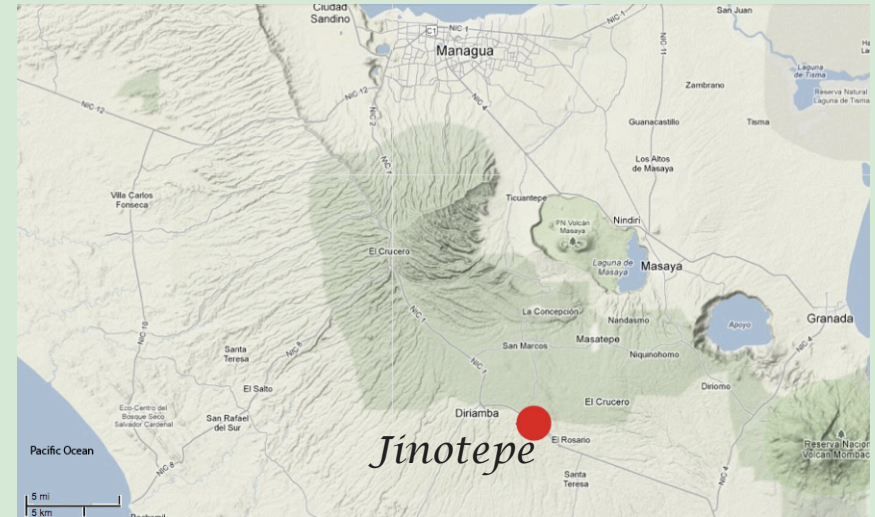


Figure 2: Jinotepe, Nicaragua



Figure 3: Rich natural environment of Nicaragua

# Background

## *The Problem*

As described above Nicaragua, and Jinotepe in particular, have an abundance of natural resources. It is an environment in which people have been able to thrive and develop rich culture for many generations. Unfortunately this once pristine environment is being contaminated by pollution. Inorganic materials have inundated the forests, beaches, and waterways. Solid waste is strewn along streets, in vacant lots, and in other public areas. Trash is burned in homes and backyards releasing toxins into the air.

There are many factors contributing to these existing conditions. The existing waste management infrastructure and operations are insufficient to handle the waste currently being produced. The Municipality has no established system for recycling or composting. There is a lack of knowledge regarding the full extent of the detrimental impacts of pollution coupled with a lack of convenient means for residents to properly dispose of waste, resulting in littering. Because there is no established system for recycling, knowledge of which materials are able to be recycled is also inadequate. Additionally there is a lack of differentiation between organic and inorganic materials. These factors can all be seen as opportunities to improve the waste management situation in Jinotepe. The resources available to the Municipality's Waste Management Department as well as the current waste management practices are described in detail below.



Figure 4: Polluted waterways in Jiotepe



Figure 5: Pollution along Jinotepe streets

# The Soil

## Current Waste Management In Jinotepe

Jinotepe's Waste Management Department currently oversees streets, parks, plazas, the marketplace, cemeteries, the slaughterhouse, and the two city landfills, "The Cemetery" and "Site Cuatro."

The City employs 49 people within the Waste Management Department. There are five administrators, three truck drivers, 18 truck assistants, and 23 carretoneros. Carretoneros operate carretones, man-powered pushcarts, to collect solid waste around the City. Drivers earn US\$ 200 per month, while truck assistants and carretoneros earn US\$ 100 - US\$ 120 each month (Guzman).

The Waste Management Department has access to a vehicle fleet comprised of six garbage trucks, one of which is equipped with a mechanical lift, one operational tractor, and 23 carretones. There are two additional tractors that are in disrepair.

The first of the two city landfills is called the Cemetery and has been in operation for over 50 years. The site is two manzanas (approximately 3.44 acres) in size and directly borders the City to the west. Many Jinotepe residents personally deliver their waste to this site due to its proximity, however this is not possible for all City residents. The site is currently at 95% capacity and the City intends to close the facility due to health reasons and limited capacity (Guzman).

The second landfill was acquired in 1998 and is called Site Cuatro. It lies four kilometers (approximately 2.5 miles) west of the City and is 8 manzanas (approximately 13.76 acres) in size. Site Cuatro is at 45% capacity and according to the Municipality is the ideal location to maintain an ongoing landfill for the entire City (Guzman). The site has some existing infrastructure in the form of gate pilings, a guardhouse, and the skeletal frame of a building, however improvements are required, including roofing for the buildings.

The access road to the site becomes impassible

<i>Waste Management Department Personnel</i>	
<b>Position</b>	<b>Number</b>
Administration	5
Truck Drivers	3
Truck Assistants	18
Carretoneros	23
<b>Total</b>	<b>49</b>

Figure 6: Waste Management Department Personnel



Figure 7: Jinotepe landfill, "The Cemetery"



# Background



Figure 8: Jinotepe landfill, Site "Cuatro"

during the rainy season and therefore also requires improvements in order to serve the Municipality year-round.

The Waste Management Department conducts solid waste collection throughout the City on Mondays, Wednesdays, and Fridays. Waste is collected and delivered to Site Cuatro except when weather prohibits, in which case it is delivered to the Cemetery.

As mentioned above the Municipality currently performs no separation of recyclables or organic materials from the solid waste delivered to the landfills

The closest facility capable of recycling materials such as plastics and metals is in Managua, approximately 44 kilometers (27 miles) to the north. There is an informally organized group of workers, who will be referred to as the Classifiers in this document, that collect recyclables and send them to the facility in Managua in order to earn an income. Their practices are described below.

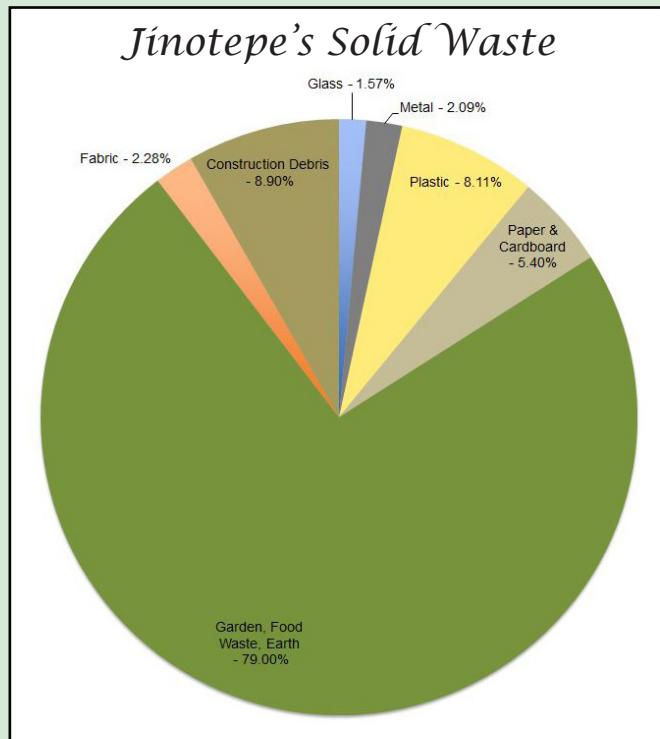


Figure 9: Jinotepe's Solid Waste

# The Soil

## Classifiers

There are 26 informal recyclers, or Classifiers, who perform the hazardous task of scavenging the City landfills in search of recyclables in order to earn an income. They work seven days a week in eight hour shifts of about ten people sorting through waste in search of plastic, aluminum, copper, bronze, paper, glass, and any other salvageable materials. The Classifiers also scour City streets collecting recyclables in the mornings, afternoons and at night. The plastic is collected into large bags called pacas and weighed to reach the desired amount of 48 kilograms (approximately 106 pounds). Pacas are collected until there are 35 to 45 filled. Once this is accomplished, about once every week, one of two middlemen is called to load the recyclables onto a truck and trailer and transport them to the facility in Managua.

The classifiers receive five Nicaraguan cordobas per kilogram (approximately 23 cents in U.S. dollars). An average truckload of 40 pacas, 1,920 kilograms or 4,233 pounds of plastic, earns a sum of C\$ 9,600 or US\$ 2,208. Split between 26 workers this approximately equates to a weekly income of C\$ 369 or US\$ 16.80 for each worker (see Figure 11).

The classifiers divert 1,920 kilograms of plastic from the City landfills each week. As seen in Figure 3 this translates to 98,744 kilograms (approximately 108.6 tons) of plastic diverted each year.

The Classifiers currently perform the task of considerably reducing the solid waste entering the landfills in extremely hazardous conditions. They sort through mixed trash, which includes syringes, broken bottles, chemicals, etc. In addition to these hazards there is also the danger of breathing toxic fumes from burning plastics and chemicals. Trash fires caused by spontaneous combustion are common within the landfills. The workers do not have the appropriate accouterments such as gloves, boots, and masks to safely perform this task.



Figure 10: Classifiers collecting recyclables at City landfill

Table2: Classifiers' plastic diversion and earnings

<i>Classifiers' Plastic Diversion and Earnings</i>					
Time Period		Daily	Weekly	Monthly	Annually
Total Plastic Diversion	(kg.)	274.3	1920.0	8228.6	98744.4
Total Plastic Diversion	(lb.)	603.4	4224.0	18102.9	217237.7
Collection per Individual	(kg.)	10.5	73.8	316.5	3797.9
Collection per Individual	(lb.)	23.2	162.5	696.3	8355.3
Earnings per kg	(1kg=C\$ 5.00)	\$ 1,371.45	\$ 9,600.00	\$ 41,142.85	\$ 493,722.00
Earnings per kg	(1kg=US\$ 0.23)	\$ 63.09	\$ 441.60	\$ 1,892.57	\$ 22,711.21
Earnings per Individual	(C\$)	\$ 52.75	\$ 369.23	\$ 1,582.42	\$ 18,989.31
Earnings per Individual	(US\$)	\$ 2.43	\$ 16.98	\$ 72.79	\$ 873.51



Figure 11: Classifiers filling pacas with plastic

# Background

This group of informally organized workers would greatly benefit from attaining legal recognition as an official labor force. Regardless of whatever progress is achieved in improving the waste management practices in Jinotepe, it is a priority of this project to ensure the continued income of these individuals as well as to assist them to improve the safety of their working conditions.

## *Chapter Summary*

Waste management practices in Jinotepe are currently inadequate and as a result pollution is accumulating in both the natural and built environment. Progress in managing waste must be made in order to preserve the environment for generations to come.



Figure 12: Classifiers encounter hazards such as burning plastic



Figure 13: Classifiers divert recyclables from filling City landfills

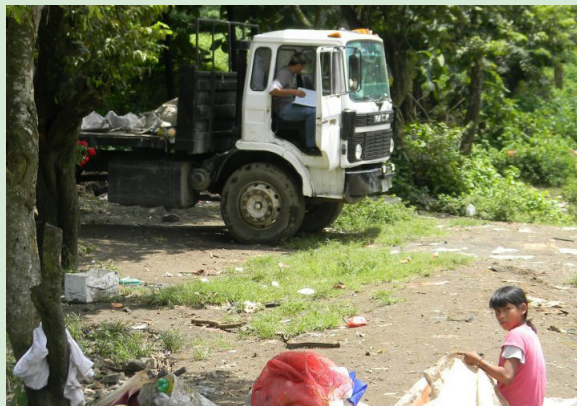


Figure 14: Classifiers hire a truck to deliver recyclables to Managua



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# Tilling the Soil

## ~Community Outreach

After becoming aware of the issues regarding waste management in Jinotepe Andrew Craig and Karen Douglas saw that action needed to be taken. This chapter will discuss the early stages of becoming a part of the community in which these issues exist as well as developing an organization to address these issues. There were many groups and individuals without whom this effort would have never taken root.



# Tilling the Soil

## Community Integration and Organization Development

With hopes of remedying these waste management issues, promoting sustainable practices, and improving the quality of life for current and future Nicaraguans and Jinotepinos, Andrew Craig and Karen Douglas, with the indispensable help of many along the way, began the process of setting in motion what is now Abran Los Ojos. The vision was, and still is, to create an inspirational model of change that can simultaneously spread a broader consciousness of proper recycling, composting, and sustainable practices while developing a separation and collection infrastructure. If this vision is to come to reality it will require a collaborative, community-based effort.

The process began with integrating into the community and getting to know the public. Knowing the people whom a community-based project will benefit and the culture in which it will take place is of utmost importance. Becoming a part of both the local and global community and connecting with established organizations was essential in the development of the Abran Los Ojos team and in casting the vision for interested parties and potential partners. As it is part of the mission to spread a broader consciousness of these sustainable concepts throughout both the local and global community, any interested parties are welcome to participate.

Elements key to the process of integrating into the global and local community have included a wide range of activities and strategies seen in the bulleted list below.

Maintaining a current website and utilizing social media such as Facebook have empowered Abran Los Ojos to become a part of the global community. Through the Internet individuals and groups from all around the world can learn about the goals and vision of the organization. The website, [www.reciclojinotepe.com](http://www.reciclojinotepe.com), has up-to-date information on what is being accomplished in Jinotepe.

The website and the Facebook page, [www.facebook.com/abranlosojos11](http://www.facebook.com/abranlosojos11), provide

## Community Outreach Tools

- Website
- Facebook
- Newsletters
- Workshops
- Cultural Events
- Informal Luncheons
- Fundraising Events
- Personal Relationships

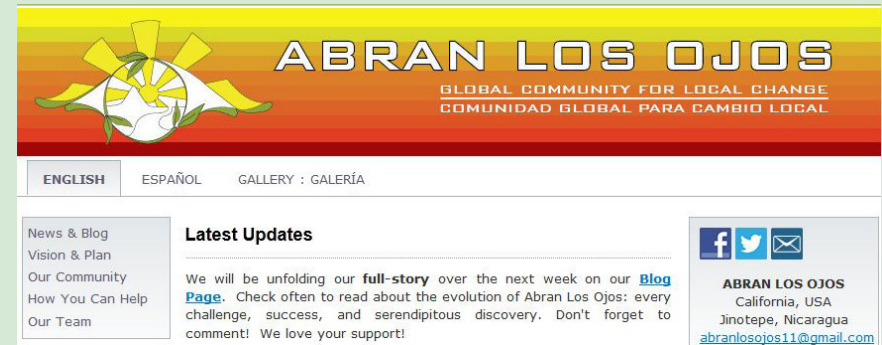


Figure 15: Abran Los Ojos website



Figure 16: Abran Los Ojos Facebook page

# Community Outreach

opportunities for interested parties to get involved. The Facebook page also serves as a forum for like-minded parties to share dynamic ideas and projects that are occurring around the world to encourage progressive movement through shared wisdom. By participating online, either by sharing ideas or by donating financially, interested parties can partner in the effort, and in essence, join the community. Abran Los Ojos also sends out newsletter updates via email to keep their community of partners apprised of the status of current projects.

Another way Abran Los Ojos has been able to extend their community is through putting on educational workshops. The use of tools like PowerPoint, poster boards, and fliers has enabled the team to express the vision of sustaining the environment for generations to come to local Jinotepinos. By inviting interested parties to participate in these workshops, the team was able to establish relationships and build connections to the community.

Abran Los Ojos has also participated in school carnivals on the Colegio San José campus. These events embody the culture in Jinotepe and bring out a diverse group of members from the community. The Abran Los Ojos team manned a booth, providing information on the vision and mission of the organization as well as the benefits of proper waste management. There was also an interactive activity in which children competed to collect the most recyclables from the carnival event and return them to bins at the booth. These events were opportunities for Abran Los Ojos to integrate into the community, forming connections with locals while concurrently spreading a broader consciousness of proper waste management.

As a form of outreach Abran Los Ojos has provided free lunch to community groups as a way of making introductions and extending an invitation to participate in the movement. Food is of cultural importance in Nicaragua and thus a shared meal is a natural way to establish a relationship that has potential to develop into a partnership to accomplish concomitant goals. This was



Figure 17: Recycling and Composting Workshop



Figure 18: Workshop with informally organized recyclers



Figure 19: Andrew and Karen with the Minister of Education

# Tilling the Soil

particularly well received with the group of informally organized recyclers, the Classifiers.

The theme consistent throughout all of these outreach efforts is establishing and maintaining personal relationships. At the roots of the matter, we are all one global community made up of individuals. To put it in the words of Andrew Craig, the most important thing to becoming a part of this community has been “livin’ and lovin’.”

## Availability of Resources

In order to develop a feasible solution to address the solid waste issues at hand it was necessary to know the various resources available. Identifying informational, infrastructural, human, and monetary resources would help to generate a plan of action that would be achievable and efficient. This process of identifying available resources to contribute to the cause of Abran Los Ojos coincides with the process of becoming a part of the community. These efforts are ongoing and can be expected to continue indefinitely. Below is a list of groups and individuals who have formed the global and local community in which Abran Los Ojos has been able to grow. These parties have also provided various types of resources that have been significant in Abran Los Ojos’ early progression.

## Global and Local Community

### Three Americas

Three Americas Incorporated is a section 501(c)(3) nonprofit organization based in the City of Santa Cruz, California. Three Americas is “an educational and action organization which serves as a catalyst to link the people of the Americas through cooperative projects supporting environmental and economic justice” (“Three Americas, Inc.,” 2011). This group provided the initial funding for both of Andrew Craig’s initial trips to Jinotepe. The active members of the organization have provided

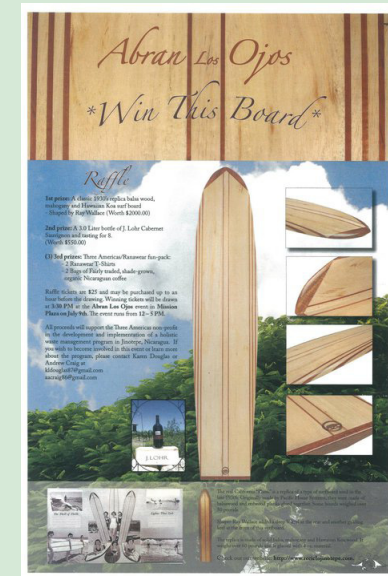


Figure 20: Fliers for outreach and fund raising

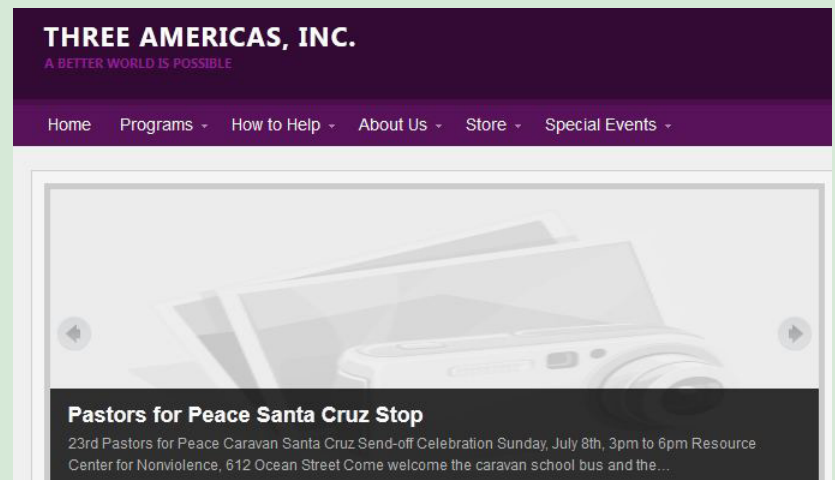


Figure 21: Three Americas, Inc. website



# Community Outreach

constant support through forming connections and collaborations throughout this process, truly living up to their mission.

## Sister Cities Santa Cruz, California

The international Sister Cities Program originated as the People-to-People Program established by President Eisenhower in 1956 to promote understanding and strengthen international ties (“Sister Cities Committee,” 2009). Sister Cities Santa Cruz holds a strong relationship to both the Sister City of Jinotepe as well as Three Americas Incorporated. Sister Cities Santa Cruz has donated two garbage trucks to the Municipality of Jinotepe Waste Management Department and has also contributed partial project funding to Abran Los Ojos, hosting a fundraiser to provide the financial resources for the Recycling Center at Colegio San José. In addition to the financial endorsement, Sister Cities Santa Cruz provides a strong, personal support system, which holds true to their mission of nurturing people-to-people connections through the promotion of an international community and cross-cultural exchanges. Their efforts have bolstered the progressive momentum of change in regard to solid waste management within Jinotepe.

## Walter Guzman

Walter Guzman formerly held a position with Jinotepe’s Waste Management Department. In the words of Andrew Craig, “He was the man who started it all.” In 2006 Walter was spearheading an environmental education campaign in Jinotepe, a truly progressive movement. Walter also led the study and authored the report of Jinotepe’s most recent solid waste audit; much of the data found in this regarding waste in Jinotepe is derived from Walter’s audit. When Andrew arrived in Jinotepe on his initial visits in 2010, he and Walter collaborated to develop a holistic strategy to address the community’s issues regarding waste. Walter has recently left the Waste Management Department to take a position with the nonprofit organization



Figure 22: Sister Cities Santa Cruz information on City of Santa Cruz website

# Tilling the Soil

Asociación Desarrollo Comunitario de Carazo to pursue greater opportunities for social and environmental progress. Walter's efforts towards the sustainable movement in Jinotepe have been instrumental in preparing the way for Abran Los Ojos' involvement.

## Ninoska Sánchez

Ninoska Sánchez is a Jinotepino, and attended the local elementary and high school. Her interest in helping the poor and solving social problems led her to study Psychology at the Universidad Centroamericana in Managua. She also studied Computer Science at the Universidad Nacional Autónoma de Nicaragua in Jinotepe, which gave her the opportunity to work with children and teenagers. Ninoska has been working at Colegio San José for 16 years. Ninoska continued her studies at the Universidad in Jinotepe in Educational Science with a major in English. Studying English gave her the opportunity to work with Americans that came to Nicaragua to assist the poor. Her recent experience working as a translator for a group of doctors from the USA with MedWish grew her desire to find similar projects.

Ninoska is confident that God blessed her with the opportunity to meet Andrew Craig and Karen Douglas. Their vision for improved waste management, a more sustainable Nicaragua, and a better world inspires her deeply. Ninoska was able to introduce Andrew and Karen to Colegio San José, where the first pilot project of Abran Los Ojos is underway. She now fills the role of Educational Director for Abran Los Ojos.

## Sor Mercedes

Sor Mercedes is the head nun and school director at Colegio San José. She was introduced to the Abran Los Ojos team through Ninoska Sánchez. Her leadership at the school and support of the pilot project have been instrumental in the success of the "Seed."



Figure 23: Ninoska Sánchez with Karen and Andrew



Figure 24: Sor Mercedes with Karen and Andrew

# Community Outreach

## Colegio San José

Colegio San José is a private school located next to the “Pedro Selva” stadium in Jinotepe. It was founded by a community of priests called “Padres Salesianos” in January of 1961. In 1985 the nun community of “Hermanas finas” came to Jinotepe and began to work at this school.

San José is considered one of the best schools in Carazo. Not only do students learn standard subjects, but they also receive classes in English, Art, Dance, Music, Computer Science, and Chess from preschool through high school. San José has highly qualified teachers, and as a result the students are highly recognized, frequently winning first place in several competitions throughout Nicaragua and Central America.

The mission of Colegio San José is to build an educational community with Christian principles, as well as to develop moral and spiritual values of humility and simplicity. The teachers and students from San José distinguish themselves with their strong cultural and civic values, as well as their concern for social and environmental issues. The school’s existing concern for environmental and social issues as well as its available open space to implement a recycling project made it the prominent choice for the pilot project.



Figure 25: Colegio San José, site of pilot project

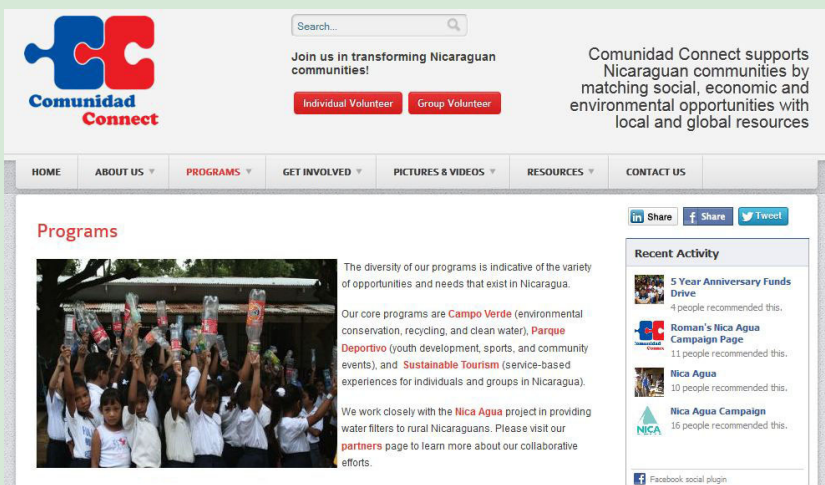


Figure 26: Comunidad Connect website

## Comunidad Connect

Comunidad Connect is section 501(c)(3) nonprofit organization working with Nicaraguan communities to facilitate sustainable community development. The organization supports Nicaraguan communities by matching social, economic and environmental opportunities with local and global resources (“Comunidad Connect,” 2011). Jon Thompson, Founder and Board President of Comunidad Connect, has provided support to Abran Los Ojos’ efforts. Comunidad Connect also financially sponsored part of an infrastructure expansion of the pilot project at Colegio San José.

# Tilling the Soil

## Project Wave of Optimism

Project Wave of Optimism is a 501(c)(3) nonprofit organization that takes a grassroots approach to promote sustainable community development in the surfing regions of Latin America. The organization works to empower people to actively change their communities according to their shared vision for the future (“Project Wave of,” 2011). Bo Fox, Program Manager and Surf ‘N Serve Program Leader for Project Wave of Optimism, has been a proponent of Abran Los Ojos’ efforts in Jinotepe. Project Wave of Optimism also contributed financially to infrastructure expansion of the pilot project at Colegio San José.

## Waste Management Department

Jinotepe’s Waste Management Department organizational structure, resources, and practices are described in detail in the previous chapter. The Department has played an important part in helping Abran Los Ojos better understand the waste management issues in Jinotepe. The Department has also agreed to add the pilot project site at Colegio San José to the collection routes on Mondays, Wednesdays, and Fridays. The Department will continue to play a pivotal role in any future progress of the waste management situation within Jinotepe.

## Classifiers

The informally organized group of recyclers, referred to in this document as Classifiers, is discussed in more detail in the previous chapter. The Classifiers substantially reduce the waste stream entering the City landfills (see Table 2 on page 18). Their continued income and improved working conditions are priorities of Abran Los Ojos and this project. A few representatives from the group have been selected to retrieve the recyclables collected at the Colegio San José Recycling Center. The individuals selected for this task cooperated with Abran Los Ojos and Colegio San José in providing police



Figure 27: Project Wave of Optimism website



Figure 28: Waste Management Department



Figure 29: Classifier at Colegio San José

# Community Outreach

records to the school as a safety precaution for the students. These selected individuals also accompanied Andrew and Karen to the school grounds to be introduced to school personnel, especially the guardsmen, to establish a working relationship between all involved parties.

## Mel Landers

Mel Landers is an American expatriate who has spent years in Nicaragua studying indigenous agricultural practices. He has dedicated his life to spreading God's love by freely sharing this valuable information to people who can benefit from it. Mel has been a significant resource for Abran Los Ojos, providing useful advice throughout the project implementation process, particularly in the planning of the garden.

## Francisco Narvaez

Francisco Narvaez is a Nicaraguan who is well educated on agricultural practices and has experience in agricultural education. Francisco was introduced to the Abran Los Ojos team by Mel Landers and has participated in the project by leading classes at the Colegio San José garden for interested students. His background and extensive knowledge is a great resource and it is likely that his involvement with Abran Los Ojos will continue in the future.

## *Chapter Summary*

Before any efforts to improve the waste management situation could be made in Jinotepe, Andrew Craig and Karen Douglas first had to integrate into the community and establish a team of partners. This is a complex and continuous process that is absolutely vital to any effort to serve a community.



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# Planning a Garden

## ~Devising a Plan

This chapter will discuss how Abran Los Ojos' vision of improving waste management and growing a sustainable consciousness is developed into a plan that will bring this vision to fruition.



# Planning the Garden

## Solution

The vision to stimulate the growth of an environmentally aware consciousness throughout the community and establish more adequate waste management practices in Nicaragua is not something that will happen overnight. A plan to see this vision fulfilled has been developed and will continue to evolve as the process continues.

As mentioned thus far, this process involves a number of continuous and concurrent activities. Becoming and remaining aware of the waste management situation within the community is important to developing a plan to improve it. Integrating into the community and understanding the culture is important in developing any plan. Reaching out to all interested parties and fostering a community of likeminded groups and individuals will establish a support network for the project. This support network will also serve to provide avenues to various resources. Through evaluation of this ongoing process a plan is developed that fits the community and utilizes the available resources. The plan must be flexible as circumstances may change.

In order to establish a cohesive waste management program that will effectively protect the natural environment in Jinotepe and Nicaragua for generations to come, the corporate program must start somewhere. The strategy is that a single, local based pilot project that embodies the characteristics of the greater vision will build momentum in the direction of the eventual goal and provide a model to learn from and replicate. The characteristics that define a successful pilot project are shown to the right.

An effective pilot project that embodies these characteristics will in and of itself begin to decrease pollution and reduce the amount of waste entering landfills. Not only this, but through educating the public, the desired sustainable consciousness will begin to spread within the community.

Byproducts of the pilot project will include a maintenance plan and a list of lessons



Figure 30: The solution will be a community effort

## *Five Characteristics of a Successful Pilot Project*

- 1) Inform the public of the negative effects of pollution and improper waste management.
- 2) Educate the public on proper waste management practices as well as the importance of living in a sustainable manner.
- 3) Enable the involved parties to participate in proper waste management procedures and effectively reduce the amount of waste entering landfills.
- 4) Utilize existing waste management infrastructure and human resources to the fullest extent possible.
- 5) Ensure project continuity by incorporating passionate individuals who are invested in the community and understand the importance of the project.





# Devising a Plan

learned that will contribute to the success of successive projects. As alluded to in characteristic five the eventual goal for the pilot project is a self sufficient system that does not require any outside assistance but instead is operated entirely by community members. This will free Abran Los Ojos staff to proceed with establishing successive projects, working towards a complete network of waste management infrastructure culminating in the cohesive program previously mentioned.

## *Chapter Summary*

In order to achieve the goal of establishing a complete and cohesive waste management program for the entire Municipality, Abran Los Ojos will begin with a local based pilot project that will serve a model to guide successive projects. The process by which the project has been implemented thus far will also be discussed.



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# Planting the Seed

## ~Implementing a Pilot Project

This chapter will illustrate important facets of the pilot project including how the site was selected, the established recycling facilities and operations, the on-campus garden, and the educational advantages of the pilot project.



# Planting the Seed

## Site Selection

The process of selecting a local private school in Jinotepe, Colegio San José, as the site for the pilot project began with Andrew and Karen meeting Ninoska Sánchez. As mentioned in the Tilling the Soil chapter, Ninoska is a science teacher and has been with Colegio San José for 16 years. Her interest in social and environmental issues as well as her strong relationship to the school served as the foundation for the relationship between Abran Los Ojos and Colegio San José. The school quickly became the optimal location for the initial project for many reasons.

Ninoska introduced Andrew and Karen to Sor Mercedes, the school director. After it was agreed upon that Colegio San José would be the site for the pilot project the next step was to cast the vision and invite the school staff to partner in the project.

## Casting the Vision and Extending the Team

Through a series of workshops Andrew and Karen educated the faculty, administration, and other school personnel on some fundamental information on waste management. This included discussion of the harmful effects of burning trash, specifically dioxin producing wastes. All waste at the school was formerly burned in pits on the school grounds without knowledge of the harmful effects to both people and the natural environment. Workshops also covered which materials can and cannot be recycled and why. Additionally, teachers were provided with instructions on how to launch small in-class recycling systems that will be instrumental in the school-wide system. The workshops were well received and enthusiasm for the project grew.

## Seven Contributing Factors to Site Selection for Pilot Project

- 1) As an educational institution it will be natural for Colegio San José to fulfill the goal of educating the public on waste management issues.
- 2) Educating youth in particular will have a greater impact on the community, as they will grow to be the future leaders of Jinotepe and Nicaragua.  
The enthusiasm that youth can bring to a project like this will also play a role in getting parents and other community members involved.
- 3) The school's prestigious reputation will contribute to the influence the project will have on the community.
- 4) The school's preexisting interest in social and environmental issues will serve to compliment the vision behind the project.
- 5) The school's faculty and administration understand the importance of the project and are invested in the community, which will help to ensure continuity.
- 6) The school has adequate open space available to be utilized for waste management facilities.



Figure 31: Casting the vision at Colegio San José

# Implementing a Pilot Project

## *Collection and Separation Infrastructure*

The team constructed a roofed shed to serve as the Recycling Center, the main recycling facility on the school grounds. The Center was constructed from wooden beams, bamboo siding, and sheets of hard corrugated plastic for the roof. The floor is comprised of large stones dug up while constructing the garden on campus. The Recycling Center houses the recycling, composting, and waste bins where these materials are collected until retrieved.

There are four bins dedicated to recyclables in the Recycling Center: one for plastic bottles with the marking 1 signifying the material is PET, another for aluminum products such as cans and foil, another for paper products, and finally a bin for organic materials. The organic materials are diverted to the compost system and utilized in the garden.

In addition to the bins in the Recycling Center there are five more bins around the campus; two for recyclables and three for mixed waste. Students and teachers can deposit recyclables and waste in these receptacles to be collected by the school groundsman and delivered to the Recycling Center. As mentioned in the Tilling the Soil Chapter, these infrastructure improvements were funded with the assistance of Sister Cities Santa Cruz, Comunidad Connect and Project Wave of Optimism.

## *Collection and Separation Operations*

Students and teachers operate their own separation and collection systems in the classrooms and deliver what is collected to the Recycling Center. For waste products produced outside the classroom, the five receptacles around campus serve to collect the material before being delivered to the Recycling Center.

The selected representatives from the Classifier group retrieve the recyclables from the Recycling Center, adding them to their truckloads sent to the facility in Managua. This is the ideal collection procedure for the Classifiers to gather recyclables without encountering



Figure 32: Recycling Center



Figure 33: Separating plastic, aluminum, paper, and organics

# Planting the Seed

risk of injury from hazards previously discussed (see page 18). It is consistent with the overall vision of the project to replicate this procedure established by the pilot project throughout Jinotepe, effectively extending the recycling infrastructure, improving working conditions for the Classifiers, and reducing the waste stream.

The school groundsmen move all waste not able to be recycled to the street so the Waste Management Department can collect it on the designated pick-up days of Mondays, Wednesdays, and Fridays.

## *The Garden Facility*

In addition to the recycling program being implemented at Colegio San José, the Abran Los Ojos team is working with the school to establish a complementary garden program. The team, with the help of student volunteers, constructed four raised garden beds on the school grounds. A barbed wire fence was also constructed around the garden beds to protect the produce. The garden site is approximately 50 meters from the school's water tank. This space compliments the Recycling Center helping to create a true "learn by doing" atmosphere at Colegio San José.

## *Garden Operations*

The garden employs an ancient model of indigenous agricultural techniques, which fosters the growth of microorganisms, mycelium, and other such beneficial soil characteristics. As previously mentioned, the compost material comes partially from the Recycling Center.

Nitrogen rich fruit peels and vegetable scraps generated by students and faculty on campus are combined with carbon rich plant trimmings collected by the groundsmen around campus to create a nutrient rich soil. Students are also encouraged to bring organic waste from home, which would otherwise likely rot within plastic bags in a landfill, serving no purpose. The students have been involved throughout the entire process



Figure 34: Students building a garden bed

# Implementing a Pilot Project

from construction, composting, germinating seeds, to harvest.

Corn, beans, squash, rosemary, oregano, basil, roses, marigolds (which act as natural insecticides), and a dragon fruit cactus are currently being grown in the garden. The seeds for these plants were mostly acquired by saving seeds from produce bought at the local market. The technique for saving and germinating the seeds was taught to the team by local Jinotepinos. Students participated in making newspaper pots and germinating the seeds before planting.

As of now there is no established program for maintaining the garden. However, there is an informal garden club in which one to three students stay after school on Friday afternoons to weed, monitor progress, and discuss uses of various plants.

## *Education*

Holding true to the vision of educating the public the pilot project is spreading the consciousness of various sustainable issues directly to the students at Colegio San José as well as indirectly to the students' friends, parents, and relatives with whom the students may share what they are learning.

Teachers are encouraged to incorporate recycling and other sustainable issues into their classroom curriculum. Ninoska has incorporated an assignment into her curriculum in which student must write and perform a short skit and the students are given extra credit if their props and costumes utilize recycled materials. The kindergarten teacher, Martha, is well known for her recycling projects within the classroom. She has devised many assignments that encourage students to creatively repurpose anything from bottles and cans to CD's. Martha also helped students form a recycling brigade to march in the school parade.

As student are exposed to the idea of reusing items previously perceived as waste, and play a role in the separation of such recyclables around the school they are learning improved waste management practices. Because students

# *Planting the Seed*

are also actively participating in the separation of organic matter from inorganic materials the concept that organic waste is not in fact waste, as previously perceived, is being taught and practiced. The students seeing the organic material being utilized in the garden to contribute in the production of food is further solidifying this concept. In addition to these waste management principles the students are also being taught other important lessons such as nutrition through the foods being grown in the garden.

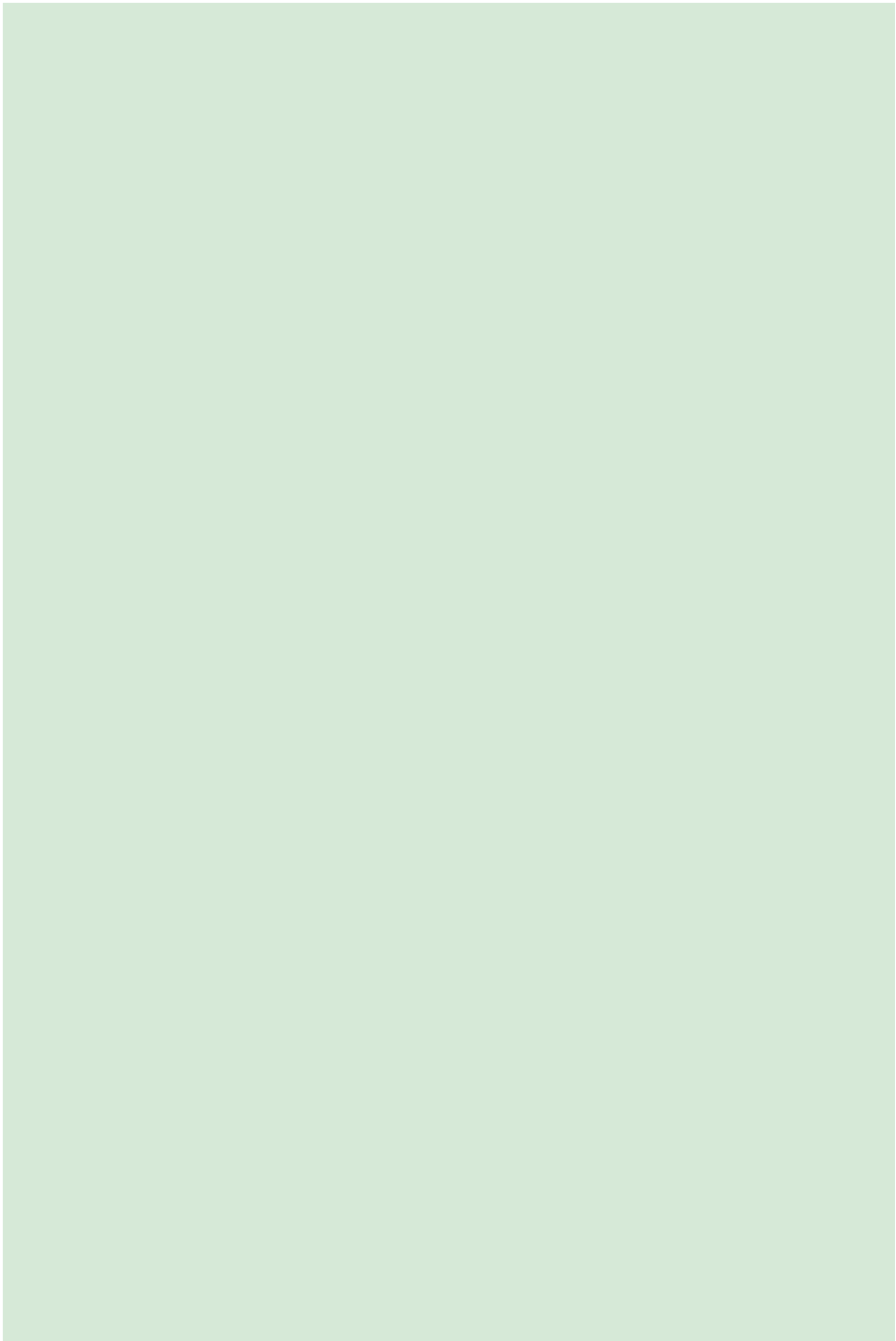
## *Chapter Summary*

“The Seed” is alive and growing. A recycling system with corresponding infrastructure has been established at Colegio San José. The Classifiers have been incorporated into the system and can safely collect the recyclable materials. The active participants (i.e. the students) are being educated on proper waste management principles. This is a model that can be replicated around Jinotepe.





# Implementing a Pilot Project



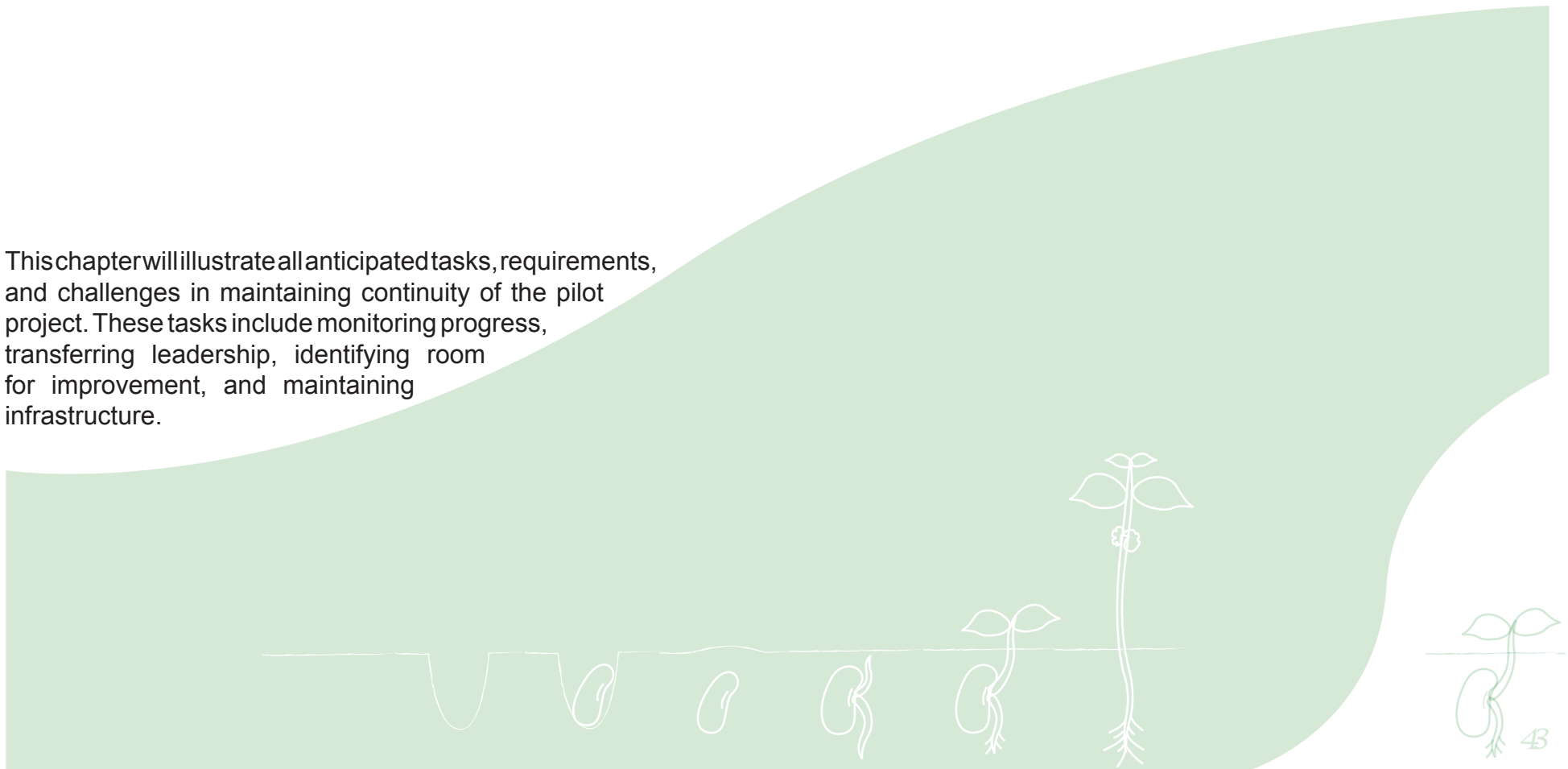


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# *Nurturing the Sprout*

## ~Maintenance Plan

This chapter will illustrate all anticipated tasks, requirements, and challenges in maintaining continuity of the pilot project. These tasks include monitoring progress, transferring leadership, identifying room for improvement, and maintaining infrastructure.



# *Nurturing the Sprout*

## *Tracking Progress*

The first step to ensure adequate maintenance and ongoing functionality of the project is to monitor the quality of all involved facilities and activities. This is currently being achieved at Colegio San José through a variety of avenues. Andrew and Karen have taken a back seat, monitoring the project from afar. This has allowed school personnel to take responsibility for the ongoing success of the pilot project.

School director Sor Mercedes has been decisive in keeping the project going. She oversees operations for the entire school and therefore her support of the project has been and will remain crucial. Sor has taken the initiative to solve problems that have arisen within the on-campus recycling system. She has been firm and consistent in establishing proper disposal of waste at Colegio San José. Clear communication between her and the groundsman has served to keep operations running smoothly.

Ninoska Sánchez has also been instrumental in the ongoing success of the project. She continues to urge fellow teachers to follow-through with the recycling system by placing recycling containers in their classrooms. If Ninoska notices any issues within the recycling system she brings them up with Sor and the issues are addressed at a school-wide level.

## *Ownership and Driving Passion*

The collective community at Colegio San José has enthusiastically taken ownership of the Recycling Center.

Everyone from the school administration and teachers to the groundsman and students actively participate in the recycling and waste disposal process. This collective ownership of the facility and a sense of responsibility to participate in the process have developed by involving the school community in the project from the very beginning. By enabling anyone, from administration to students, to participate in planning and implementation, the community has become invested in



# Maintenance Plan

the project. This sense of pride and ownership is key to the project's lasting success.

As mentioned above both Sor and Ninoska have shown initiative in making sure the project continues. Their understanding of the importance of the waste management issue, their passion to see progress, and their continued leadership will be the energy that keeps the Seed growing.

## *Room for Improvement* Recycling Paper

As previously mentioned the system for separating plastic, aluminum, and organic compost material from the non-recyclable waste is running smoothly. For some reason however, paper goods are not being separated from the waste as thoroughly. The facility in Managua where the Classifiers send the recyclables has the means to recycle paper, so there is no reason for paper produced on school grounds to be sent to the landfill. The school community may benefit from a workshop covering the amount of paper goods filling the landfills and the advantages of recycling paper.

## Garden Leadership

Although the school community has taken ownership of the recycling system, it has been more difficult to find school personnel interested in providing the necessary leadership to fully operate the garden. For a single person to fill this leadership position could be potentially time consuming. Many teachers are enthusiastic about participating in the garden but lack the free time to dedicate to spearheading the program.

Currently Karen Douglas is overseeing the continued maintenance of the garden with help from school personnel and a few interested students. The high school science teacher, Virginia, has dedicated some class sessions to the garden, encouraging her students to volunteer in maintenance duties. The informal garden club mentioned in the



Figure 35: Garden maintenance is dependant upon future plans for the garden



# Nurturing the Sprout

previous chapter also helps to maintain the garden.

Karen is in the process of assembling a garden guidebook complete with basic information necessary to maintain a garden along with possible activities for students. This guidebook will be presented to interested school personnel including Sor, Ninoska, and Virginia. Hopefully with the guidebook it will be easier for the interested school personnel to develop a plan to best utilize the garden facility. This could range from keeping the garden as a demonstration garden, to adapting it into an outdoor classroom in which science teachers would plan garden sessions into their class curriculum. This second option could potentially take care of all required maintenance for the garden.

## Infrastructure

### Recycling Center

The Recycling Center has withstood its first rainy season with minimal deterioration. The plastic roof has proved to be a good investment as it has largely protected the shelter from the rainwater. However, the roof began to serve as a storage place for tools such as rakes and shovels as well as large tree branches, which caused some standing water, that in turn dripped onto the recyclables below. This small amount of water is not an issue for cans and bottles, but could be problematic if paper continues

to be recycled. In time, when resources permit, it could be a good investment to replace the roof with a heavier grade plastic to increase durability. Aluminum alternatives are likely to rust in the wet weather, requiring much more maintenance. The bamboo siding has held up well, but would benefit from a cleaning and application of another coat of water-resistant varnish during the next dry season. The stone floor has also functioned quite well, keeping the recyclables slightly raised off of ground level and out of fallen rainwater. A

few stones have been moved or stolen, but these can easily be replaced for no cost



Figure 36: Plastic roof and bamboo siding require minimal maintenance

# Maintenance Plan

by finding replacements on the school grounds. The recycling and waste bins are very durable and should suffice for all of the school's needs for years to come if properly cared for.

## The Garden

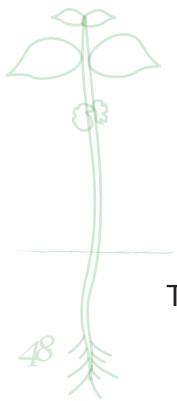
During the rainy season the garden does not need to be watered. During the dry season however, the garden requires watering about every other day. As previously mentioned, Colegio San José has a large water tank located approximately 50 meters from the garden site. At this point the students transport water in buckets and bottles from the tank to the garden during their daily 45 minutes recess. This only requires a handful of interested students with the guidance of a teacher, a small portion of the recess period every other day. A hose would expedite and simplify this process but is not entirely necessary. There is no shortage of organic material to be utilized as compost for the garden. As previously mentioned, food scraps combined with grass and shrub trimmings make up the nutrient rich compost for the garden.

Depending on what is decided upon for the future use of the garden, more tools could be a useful addition. If the garden continues as mainly a demonstration garden, the existing tools should suffice. If the garden begins to be used as an outdoor classroom, the students would benefit from a few more hand tools, enabling a larger group of students to be concurrently participating in activities.

## *Chapter Summary*

The recycling program is complete and has everything necessary to continue successfully. The on-campus garden is functional but requires some planning in how to best be utilized. Necessary facility repairs and improvements will be minimal and can likely be funded by sponsoring organizations.





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# *From the Seed to a Garden*

## ~Deriving Lessons from Pilot

This chapter will identify lessons learned during the implementation of the pilot project. These lessons are intended to foster success in additional waste management projects within Jinotepe and Nicaragua, as well as any such pilot-to-corporate model for change.



# From the Seed to a Garden

## *The Seed*

Although the pilot-to-corporate model being utilized in Jinotepe is in its early stages, it has the potential to result in considerable impact on the City of Jinotepe and the whole of Nicaragua if the project continues to expand. The “Seed” has already displayed its potential for success by drastically improving the waste management practices at Colegio San José. This model, if replicated in communities throughout Nicaragua, can one day manage what once seemed like the insurmountable obstacle of rampant waste.

## *Beyond Nicaragua*

This pilot-to-corporate model can be implemented to address a broad range of issues. Situations in which these strategies can effectively be applied are ones in which support and leadership of higher levels of government is lacking. This model for change is community-based and therefore would be implemented at the local level, having local ramifications.

An example of such an issue is the provision of potable water to millions of people in the developing world. Often governments in developing countries lack the stability of resources to provide their citizens with clean drinking water (Rudra, 2011). In such instances education of the public leading to locally derived strategies is an appropriate solution. This entails working to achieve success at a single locality, adapting, and replicating the effort elsewhere to see widespread improvement.

Another situation in which this model could be applied is with composting in San Luis Obispo, California. The Cold Canyon Landfill has discontinued its green waste composting services and has not included this service in the site’s expansion proposal (Velie, 2012). If composting is going to continue in San Luis Obispo it will have to start small and grow, suitable conditions for this pilot-to-corporate model.



# Deriving Lessons from Pilot

## *Lessons Learned*

The following is a summation lessons learned during the implementation of the pilot project. These lessons are intended to foster success in additional waste management projects within Jinotepe and Nicaragua, as well as any such pilot-to-corporate model for change.

## *Community Outreach and Participation*

As illustrated in the Tilling the Soil chapter, community outreach and participation are vital to the success of any such community-based project. Knowing the people whom a project will benefit and the culture in which it will take place is of utmost importance. Involving the public in the planning and implementation of the project enables them to feel invested in the project. This can be further achieved by ensuring that locals take leadership roles. It is not uncommon for nonprofit organizations to spearhead efforts for change and then soon after the organization leaves the locality circumstances return to the previous conditions without sustained leadership (Craig, 2012). Local leadership prevents this from happening and the resulting sense of pride and ownership of the project is key to lasting success. This lasting success has been a priority from the beginning in Jinotepe and the involvement of Ninoska Sánchez and Sor Mercedes has and will continue to be crucial. A growing relationship with the Minister of Education in Jinotepe also has the potential to develop into another local leadership role, encouraging growth of the project.



Figure 37: Community participation is vital

## *Flexibility*

When organizing a grassroots effort, plans are bound to change. It is important to incorporate flexibility into the planning of a community-based project. This is possible by maintaining strong vision of the desired results but being open minded as to how the goals will be accomplished. Working with volunteers especially, it can be expected



# From the Seed to a Garden

that schedules and timelines will need to be adaptable. This also holds true for resources. It is not uncommon for access to financial and material resources to seem promising and then fall through at the last moment. This is when flexibility, determination, and a healthy community of supporters prove to be invaluable (K. Douglas, personal communication, 2012).

## *Money Should Not be an Obstacle*

It is amazing how much can be accomplished with such small financial resources. Resourcefulness and hard work can go a long way in community-based projects. Resourcefulness can be as simple as using what is lying around to fill a need. For example, utilizing the stones dug up in the garden at Colegio San José as the floor for the Recycling Center. Gifts in kind and financial contributions can also be utilized to accomplish a lot. Again, it is important to maintain a healthy community of like-minded individuals and groups. Connections with other nonprofit organizations, community action groups, and government agencies can often lead to mutually beneficial relationships in which one group's extra resources fit the needs of another. Another form a mutually beneficial relationship is a more formal sponsorship in which an organization can provide goods or funds for a project and in return receive exposure through the sponsorship. Large corporations such as Sinsa (similar to Home Depot in the US) or Ace also have the means to donate to a cause, i.e. potentially contributing garden tools to expand the garden project at Colegio San José (K. Douglas, personal communication, 2012). Grant writing is yet another way to gain access to resources. Through this process of gathering funds, materials, and volunteer hours resources can begin to accumulate and a project can end up having much more than it started with.



Figure 38: Resourcefulness and hard work can go a long way

# Deriving Lessons from Pilot

## *Look for Co-benefits*

Grassroots efforts for change often result in effects that extend outside of the focal issue. These incidental effects, or co-benefits, can occur in various disciplines including the environment, education, economy, public health, social justice and others. Co-benefits provide opportunities to extend the community of support and further develop mutually beneficial relationships. It is possible for potential partners to not be concerned with the focal issue of a project, but choose to participate because they find value in one or more of the co-benefits. Often individuals within a partnering group will even be interested in different co-benefits but collaborate to accomplish the concurrent results. Beyond the environmental focus of the pilot project many of Abran Los Ojos' partnership were formed or strengthened through co-benefits. The following list of such partnerships is not exhaustive but is intended to illustrate the wide range of possible partnerships through diverse co-benefits of a community-based project.



Figure 39: Educating the future leaders of Nicaragua



Figure 40: Helping the families of the Classifiers

## Education

Abran Los Ojos has formed numerous partnerships strengthened by the shared desire for broader understanding of important issues. These partnerships include Walter Guzman, Mel Landers, Ninoska Sánchez, Colegio San José, the Minister of Education, and countless more.

## Social Justice

Many partnerships were also formed on the basis of social justice issues. These include partnerships with the Classifiers, Comunidad Connect, REDnica, Sister Cities Santa Cruz, and others. One of the specific social justice co-benefits that serves as a cause for these groups to support is the effort to aid the Classifiers in attaining legal status which will improve working conditions and a stabilize income.



# From the Seed to a Garden

## Public Health

There are many public health co-benefits to properly managing waste in Jinotepe. One of the largest is the prevention of inhaling toxic fumes from burning plastics and chemicals, which can have severe health implications including cancer. The Municipality, Colegio San José, the Classifiers and others are amongst the partners of Abran Los Ojos that support the public health co-benefits of the pilot project.

## Economics

A grassroots recycling program in Jinotepe will reduce the waste stream entering the Municipality landfills, effectively extending the life of the landfills at no cost to the City. This is an economic co-benefit that has lobbied the support of the City and the Waste Management Department.

## *Remain a Humble Student*

One of the most important lessons to take away from the pilot project in Jinotepe, in the words of Karen Douglas, is to “remain a humble student, always.” This is especially relevant to educated privileged “experts” seeking to give guidance in a foreign culture, but holds true in all situations. There is always much more wisdom one can learn than what he or she has to offer.

Proverbs 1:7



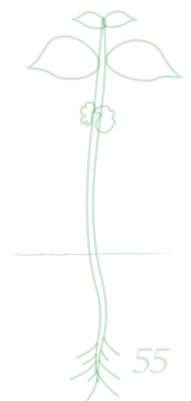
## *Chapter Summary*

The “Seed” has proven to be successful in reducing the waste stream at Colegio San José however; the accomplishments far exceed the school campus. The lessons learned in the planning and implementation of the pilot project, have far reaching applications. The “Seed” is working to fulfill the vision of Abran Los Ojos by becoming an inspirational model for change.



Figure 41: Alleviate public health hazards

# Deriving Lessons from Pilot





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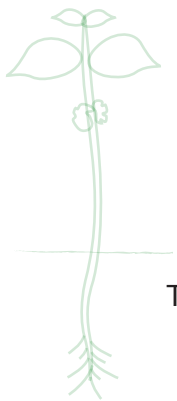
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