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# Re-establishing Recycling in Monteverde, Costa Rica

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## ABSTRACT

As consumer culture continues to expand on a global scale, the importance for responsible waste management also becomes increasingly important (Assadourian et al. 2004). In Monteverde, Costa Rica a recycling program was sustained from 1996 until 2003, successfully diverting 78 tons of waste from local landfills (Friends of the Monteverde Cloud Forest, 2007). In order to evaluate the former program, identify the current obstacles restricting its re-establishment and to identify key aspects of a successful future program I performed interviews and surveys of its main constituents within the community. This included interviews with the organizations involved in both past and future programs, talking with businesses and tourists in the area and conducting a survey of local residents. A combined effort between the Municipality and Tropical Science Center is currently working on its re-establishment and broad support from all potential users of the community was found to exist. However, raising the needed \$20,000 – 40,000 dollars to build a local recycling center is a very large obstacle for the community. Through analysis of the information I collected in both surveys and interviews I make some recommendations and suggestions for what would constitute a successful future recycling program for the Monteverde area.

## RESUMEN

Si la cultura de consumo continúa expandiéndose a escala mundial, la importancia para el tratamiento de desechos responsable llega a ser también cada vez más importante (Assadourian et al. 2004). En Monteverde, Costa Rica un programa del reciclaje se sostuvo de 1996 hasta 2003, desviando exitosamente 78 toneladas del desecho de vertederos locales (Amigos del Bosque de Nube de Monteverde, 2007). Para evaluar el programa anterior, identifique los obstáculos actuales que restringen su restablecimiento y para identificar los aspectos claves de un futuro programa exitoso realicé entrevistas e inspeccioné los componentes principales dentro de la comunidad. Estas entrevistas incluídas con las organizaciones implicadas en los programas pasadas y futuros, hablé con negocios y turistas en el área y realicé una inspección de los residentes locales. Un esfuerzo combinado entre el Municipio y el Centro Científico Ciencia Tropical trabaja actualmente en su restablecimiento y apoyo gran de todos los usuarios potenciales de la comunidad fue encontrado en el lugar. Sin embargo, para realizan el proyecto se necesita \$20.000 – 40.000 dólares para construir un reciclaje local central, y este es un obstáculo muy grande para la comunidad. Por el análisis de la información que reuní en ambas inspecciones y entrevistas del programa de reciclaje hago algunas recomendaciones y las sugerencias para lo que constituirían un futuro exitoso para el área de Monteverde.

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## INTRODUCTION

Over-consumption, once generally characterized by North America, Europe and Japan, is becoming more and more common throughout much of the developing world (Assadourian et al. 2004). The World Watch Institute estimated the total number of people within the “consumer class” in the year 2004 to be at 1.7 billion people. The

amazing amount of waste created by this expanding consumer culture is a huge burden for the world's resources. Although reduction of the total amount of waste being generated is necessary for true environmental sustainability, responsible disposal is vital as well (Assadourian et al. 2004). Recycling has become one important tool in relieving some of the negative environmental effects of the world's increased accrual of waste, diverting it from entering crowded landfills & reducing the amount of raw materials consumed (US EPA 2006).

Tourism, among many things, is a huge driving force in this spread of the consumer culture. As one of the largest industries in the modern world, it is bringing huge numbers of people and resources to some of the most poor, remote communities around the world (IES 2005). Even though many travel with the idea of eco or sustainable tourism, the communities they visit still often find their resources and community infrastructures overwhelmed, often times making truly responsible waste management impossible (Assadourian et al. 2004, IES 2005).

Even for the most developed countries, responsible waste management is limited. A report put together by the 24 OECD countries reported an average of only 16% of total waste recycled in 2004 (Assadourian et al. 2004). Designing a recycling program is a unique process for every community, no matter where it is. As every community has its own distinctive set of obstacles, limiting resources and constituents to take into account (Strauss 2007). There is no universal design for a perfect recycling program. Whether it is mandatory door-to-door collection, free voluntary community bins or pay-as-you-throw, a successful program will be one that utilizes the community's resources in the most effective way to generate the most participation as possible. It will be as streamlined and easy to use as possible. The community will be educated about their recycling choices and the goal will be for recycling to become a normal part of life (Strauss 2007).

Monteverde, Costa Rica is one of these small, isolated, quickly developing, tourist-based economies that is currently burdened by a burgeoning increase of waste. When beginning this project I understood that although Monteverde was a pioneer in Costa Rica, instituting a recycling program about 11 years ago, it was ended about five years ago for unknown reasons (Friends of the Monteverde Cloud Forest 2007). My goal for this study was to investigate the history of the old program, why it ended, what obstacles it faces for its re-establishment and what system would constitute the most successful recycling program for the community.

## **MATERIALS AND METHODS**

### **Study Site**

The greater Monteverde area consists of several neighborhoods, including Monteverde, Cañitas, San Luis, Cerro Plano, Santa Elena and el Cementerio (Appendix 1). The area has grown extremely fast since the early 1980s due to tourism (Nadkarni and Wheelwright 2000). The original community of a handful of dairy farmers that supported one four-room pension in the 1970s now houses more than 200 businesses including 18 larger hotels, many smaller inns, tourist companies, restaurants and gift shops (Grosby 2000, Cabaza Salona, U. personal communication). Although the population of

Monteverde itself is still quite small, with only about 720 official households in the area (Cabaza Salona, U., personal communication), the community is visited by 120,000-150,000 tourists per year (Hawkes 2006). This influx of people and activity has put a strain on the local infrastructure. Before 2003 community services such as road maintenance and waste-management were provided by the Development Board, a group of influential community members. It was not until 2003 that a municipality was established for the community of Monteverde.

### **Former Recycling Program and Future Plans**

In 1996 a recycling program for the area of Monteverde was begun by the Tropical Science Center within the Monteverde Cloud Reserve in association with the Development Board. The program was functional for about 7 years and collected over 78 tons of recyclable material during its life (Friends of the Monteverde Cloud Forest, 2007). Therefore, my first goal was to gain a better understanding of the history of the old program, its successes, the obstacles it faced, the reason it was disbanded and if actions were being made for its re-instatement. In order to do this I conducted interviews with the two organizations integral to the past program. The first person I spoke with was Wendy Rockwell, a member of the Development Board at the time of the old program and who is still active within community issues. I then interviewed Mercedes Diaz, Environmental Educator for the Tropical Science Center, who had the most exposure and experience working on the old recycling program. My goal for talking with Mercedes was to further elucidate the issues leading to the old projects termination and to hear the Tropical Science Center's ideas and goals for reinstating a recycling program.

Next I conducted an interview with Unifreth Cabaza Solano, as a representative of the Municipality. As another organization most likely to work on the programs re-establishment, their goals, resources and ideas would be essential in understanding the situation at hand. My objective was to gather the demographic information, such as the number of residents and businesses in the area, the amount of garbage collected and an understanding of the current garbage collection program, which a recycling program would need to compliment.

### **Local Participation**

In designing a recycling program for the community it is imperative to include the opinions, support and potential participation of local constituents. I identified three: businesses, tourists and residents. Businesses were chosen as a main constituent as they contribute a disproportionate amount of trash to the community's waste management system and the fact that they benefit from sustainable practices by attracting eco-minded tourists. Also, businesses were the largest participant in the past program, so I saw them as a great resource for assessing the success of the old program, independently from the organizations in charge. I was also interested in evaluating their potential support, both monetary and participatory. I interviewed 15 different businesses, including hotels, supermarkets and restaurants to account for the various financial and socio-demographic differences in the area and to evaluate different opinions, needs or support (Appendix 2, 3).

The thousands of visitors to Monteverde contribute a huge amount to the total waste accumulated within the area and therefore, they were my second constituent group. Most come with the goal of observing the amazing biodiversity housed within Monteverde's many hectares of protected area (Cavanagh 2005; Weinberg et al. 2002). As a result, the majority of visitors are at least somewhat conservation oriented and have an interest in seeing the town clean and practicing environmental consciousness (Hawkes 2006). This expectation by the tourists who drive the economy could provide a strong motivation for local businesses and hotels to support environmental initiatives such as recycling.

I conducted short interviews with 28 individual tourists asking them questions in order to assess their general expectations for a nature-oriented destination, what kind of materials they are generating and their potential participation in a recycling program (Appendix 4). In order to receive a comprehensive sampling of the many different people who visit Monteverde, I interviewed at two different locations, the Monteverde Cloud Forest Reserve and in the area of Santa Elena. In general, I expected most visitors to be interested in environmental issues such as recycling.

Although there is a relatively small number of residents in the area, about 715 households, their role as permanent stewards of the area, their participation and education would be crucial to a successful recycling program. After speaking with Wendy Rockwell and identifying some of the main obstacles facing the community in re-establishing a successful recycling program, I developed a survey for households in the Monteverde area (Appendix 5). In order to account for the wide array of socio-demographic constituents represented within the town of Monteverde (from farm families to taxi drivers to housewives to artisans) I sent surveys out to the families in which the Spring 2007 CIEE students were living, which included all the major neighborhoods of Monteverde and were known to represent a large socio-demographic range of the community.

My goal for the survey was to assess community members' potential participation, their knowledge of recycling, their interest in a new program, the success of outreach and participation in the old program and the potential materials that households would contribute to a recycling program. Understanding these aspects of the residential community could help assess what services could create the greatest participation in a new program.

## **RESULTS**

### **Community Interviews**

#### **Past Program**

##### **Interview with Wendy Rockwell, Community Member and former Development Board Member**

Before the creation of the recycling program or the Municipality, the Development Board had responsibility for waste management. The garbage collection program was pay-as-you-throw, in which the residents would buy special plastic bags for their waste, costing

between 25 and 50 cents, which funded the management and functioning of the program. A large problem for the success of this program was the fact that some community members would either burn their waste, bury it or dump it into the public depositing sites, hotels' garbage bins, or elsewhere to avoid paying (Rockwell, personal communication).

In 1996 the recycling program was founded by the Development Board in concert with the Tropical Science Center (CCT). The entire project was supported by the CCT, varying between \$4,000 to around \$12,000 per year. These funds covered the employee's salary, transportation and occasionally rent for the main collection site. Community members could dump their material into one of five community dumping sites with the main collection site at the current Galerón Cultural. Hotels were seen as the largest and most important participants and many transported their own recyclable materials to the collection sites. All materials were sorted by one employee, although he sometimes received help from volunteer efforts by the local schools. He would use the Reserve's truck to pick up material where it eventually was transported out of Monteverde to be sold. However, the limited transportation ability with only one truck and therefore the limited amount of waste they had to sell made it difficult to receive a substantial price for their materials. This, compounded with the high transportation costs out of Monteverde, made the program economically unsustainable.

### **Interview with Mercedes Diaz, Environmental Educator, Tropical Science Center**

The program was initially working with 22 separate communities and 42 businesses (schools, hotels, supermarkets, etc) within the Monteverde area. The five community dumping sites were located at the Co-op Santa Elena, the Galerón Cultural, the Librería Chunches, el Cementerio and one near San Luis. The University of Georgia's biological station in San Luis was believed to have taken some of the recyclables generated in San Luis into a dumping site further into town. Ms. Diaz identified one of the main issues facing the old program as not have a permanent central collection center. Instead, it constantly changed depending on what was cheapest or what was donated for free. The Galerón Cultural ended up being their more permanent collection site, which they were using for free. However, it was eventually purchased by another company, leaving the program with no main collection site and no alternative. This was the other chief reason for disbanding the old project.

### **Current Waste Management System**

#### **Interview with Unifreth Cabaza Solano, Municipality**

When the Municipality was formed in 2003 it restructured the garbage collection system to be funded through a mandatory garbage fee for all residents and businesses, disbanding the pay-as-you-throw system. There are about 5 different categories of land owners, which determine a resident's fee. All residents pay one set fee (about \$5 quarterly), while businesses are divided into 10 different price-levels, which is determined by the weight of their garbage. This weight was defined at the beginning of the program and as

far as I understand will not be re-evaluated any time soon. Currently 720 residential households and 215 businesses pay the current fee, equating to a total budget of about \$30,000 per year for the garbage program (Rockwell, personal interview).

Every week about four large truckloads are being collected equating to approximately 1,400 55-gallon barrels of garbage per month. Residents and businesses put garbage in plastic bags, place them on side of the main road and are picked up twice a week. They estimated that about 30% of the waste is made of recyclable material. The garbage is then taken to a landfill in Puntarenas.

The Municipality is currently conducting a small-scale recycling program collecting plastic, cardboard, glass and aluminum cans from about five businesses (Table 3). It is placed behind the municipality's building and is sent to a recycling center every few months. Individuals outside of Monteverde are also picking up motor oil, car parts and scrap metal from local businesses to be recycled. There are also some businesses in the area that have agreements with beer and soda companies to recycle aluminum cans and glass bottles (Rockwell, personal interview).

### **Future Project**

#### **Interview with Wendy Rockwell, Community Member and former Development Board Member**

Currently the CCT, Municipality and Community Board are working on re-installing the recycling project. The Colegio Santa Elena has agreed to donate a plot of land 500 m<sup>2</sup> in which they can build a recycling center. They estimate the building to cost between \$20,000 and \$40,000, which they hope to fund through community donations. They are planning to purchase a compactor, glass crusher and possibly plastic shredder. If the materials can be processed and readied for sale within the city it is believed that some buyers would be willing to pick up the material here, cutting transportation costs out of Monteverde. It would also increase the price that companies would be willing to pay for the material, which would hopefully making the project mostly financially self-sustainable. This is a very important aspect of the program since at the moment neither the CCT nor the Municipality will be able to contribute financially. However, they are considering increasing the garbage tax to supplement logistics such as collection and transportation. Ms. Rockwell also expressed that they are not considering the use of individual garbage bins for residents.

At the moment they foresee accepting glass, aluminum, cardboard, paper, and plastic #1 under the new program, but much of it will depend on dynamic price changes that plague this business and the amount of recyclables being amassed.

The CCT will be in charge of public outreach and education, while the municipality will take responsibility for collection services. The Municipality has created a Community Board, which Wendy is a member of, in order to research possibilities for Monteverde's recycling project. They have been talking with communities in Costa Rica who currently recycle and touring other recycling centers.

### **Interview with Mercedes Diaz, Environmental Educator – Tropical Science Center**

Mercedes Diaz's ideas for the future project were very congruent with Wendy's. She also mentioned increasing the garbage tax to help with funding and the goal for sustainability for the project through sales of compacted material. She informed me that a compactor is in their possession, but must be fixed and that they are looking into purchasing a glass crusher. However, the Tropical Science Center does not have any money of its own to donate to the project.

### **Interview with Unifreth Cabaza Solona - Municipality**

At the moment they have no money to contribute to a recycling program. However, they say that they are taking responsibility for seeing the program re-instated.

### **Tourist Interviews**

I spoke with 28 tourists representing a wide socio-demographic sampling, including seven nationalities, ages from 20s to 50s, an equal percentage of male and female and representing nine different hotel accommodations (Table 1). I interviewed four separate days, two times at the Monteverde Cloud Reserve where I interviewed a total of 24 people, and one day walking around Santa Elena where I interviewed four people.

All 28 interviewed stated that recycling was important and that they would use a recycling option. Twenty-four out of the 28 (85.7%) interviewed said they would save their recyclable material to throw away at their hotel if recycling was available. Some suggestions for ideal locations for placing public recycle bins were at tourist attractions, at bus stops, parking lots, in shopping areas, street corners and rest benches. Many people noted that they had seen recycling programs in other communities of Costa Rica and were surprised that Monteverde did not. Those people staying at Arco Iris also informed me that they are recycling at the hotel.

When asked what kind of recyclable materials they use while traveling, 17 of 19 (89.5%) said they buy plastic water bottles. Two individuals expressed concern with the safety of the water as a reason for purchasing water in bottles and even people who brought their own water bottles often said they still purchase bottled water. Six (n = 19) individuals or 32% mentioned paper, and two (n = 19) or 11% mentioned glass and aluminum.



Table 1. The variation in nationality, age and choice of accommodation among 28 tourists interviewed in Monteverde, Costa Rica at the Monteverde Cloud Forest and Santa Elena.

<b>Nationality</b>	<b># interviewed</b>
Canada	2
Belgium	1
Switzerland	5
UK	3
Holland	2
Sweden	1
United States	14
<b>Age</b>	<b># interviewed</b>
20s	10
30s	5
40s	3
50s	10
<b>Hotel</b>	<b># interviewed</b>
La Pension	6
Arco Iris	5
Heliconia	5
Poco o Poco	1
La Montana	3
Cloud Forest Lodge	1
Rustic Lodge	2
Tinas Casinas	3
did not know	1
not staying night	1

### **Business Interviews:**

After compiling the answers I received from the 15 businesses interviewed (Appendix 2), I found they believe recycling is important. Fourteen out of the 15 or 93% of the businesses said yes, it is important for them and that they would like to see recycling re-established in Monteverde. Nine out the 13 businesses operating at the time of the old project, or 70%, participated in the old program. Out of the six businesses who responded to the question of who they would like to see run the program; four said they preferred the reserve, one was impartial and one said the municipality. A few businesses voiced doubts about the municipality's ability to run the program.

Through the interviews I also found that many businesses are actually doing their own recycling, even without a community wide program. This includes six of the 15

businesses I interviewed and three others (a complete list of all the businesses who are currently recycling can be found in Appendix 6 and program specifics can be found in Table 3). Also, 11 out of the 15 interviewed either sell their organic waste to farms or use it for their own gardens, etc. The only businesses that did not were hotels without restaurants and the Mini-super Cañitas both do not generate much organic waste.

For the question of financial contribution, four out of the 15 (27%) said yes, they would be willing to contribute, four out of the 15 (27%) said no (many stating financial problems) and six out of the 15 (40%) said possibly (often depending on whether or not they liked the program). Sixty-seven percent said either yes or most likely to a possible financial contribution and the majority of those businesses that said no voiced problems with personal funds as their reason for not being able to contribute. In talking to the manager of Selvatura, one of the large zip-line businesses in the area, I discovered that they also own the Heliconia hotel and are extremely supportive of establishing a recycle program. The Belmar also voiced enthusiastic financial support of a new program.

Only three of the ten hotels and restaurants I interviewed said they would willingly transport their own recyclable waste, while the other seven said they would prefer pick-up. The seven asking for pickup averaged 7.7 bags per week and those who were willing were generally larger businesses with an unknown large amount of waste and their own transportation. Finally, when asked about recyclable materials they had, the most common materials were found to be plastic and glass (Figure 2).

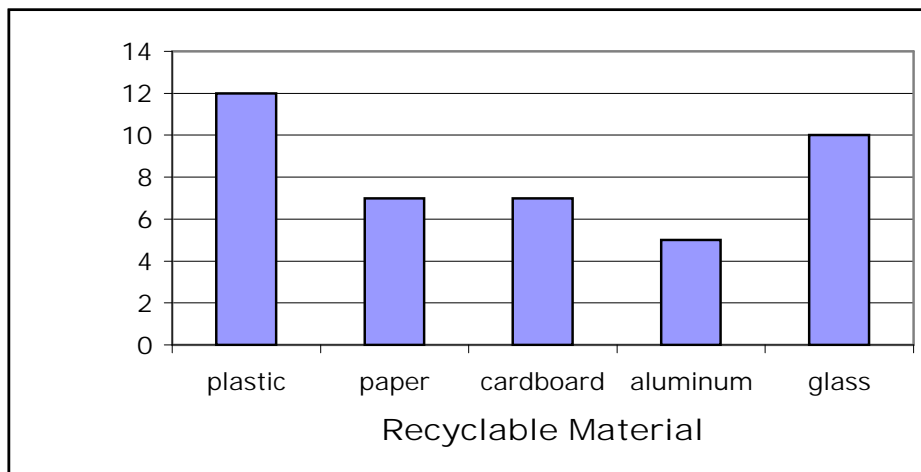


Figure 1. In the interviews with the Monteverde businesses I asked them what kind of recyclable materials they generate (plastic, paper, cardboard, aluminum, glass, wood, food). This figure shows the number of businesses (out of the 14 who answered the question) who mentioned having the 5 most common materials.

## Residential Surveys

Twenty surveys were returned and the distribution of these households throughout the Monteverde area can be found in Table 2. I found an average of 2.2 (SD=1.86) large bags of garbage generated per week. There were two separate questions assessing what kind of recyclable materials they generated; Question #6 asked them to write down what

recyclable materials they have in their garbage and question #13 asked them to check whether or not they generated seven different recyclable materials (plastic, paper, cardboard, aluminum, glass, wood and food). Answers from the two questions showed that paper, food, plastic and cardboard were mentioned the most, while wood; aluminum and glass were the least mentioned (Figure 2). Six households utilize their organic waste in some way.

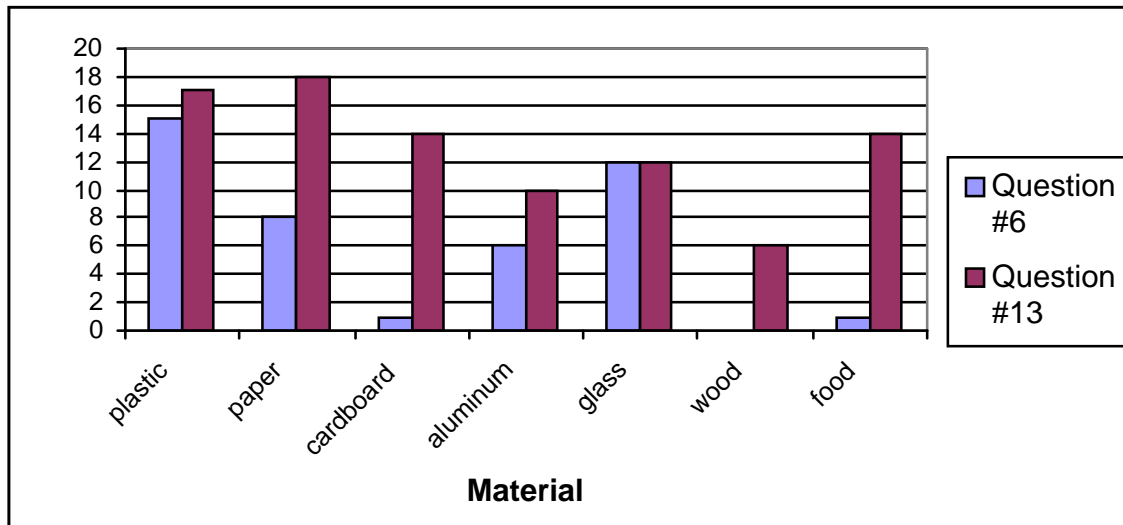


Figure 2 In the surveys given to 20 Monteverde households they were asked in two separate questions what kind of recyclable material they generated. Question #6 allowed them to fill in their response while question #13 asked them to check whether or not they had these 7 different materials (plastic, paper, cardboard, aluminum, glass, wood, food). This figure shows the number of households mentioning the 7 different materials in the two separate questions.

When asked if they felt recycling was important, 100% (n = 20) said yes. Seventeen (n = 17) expanded on this question and included statements, such as decreasing waste, conserving raw materials and cleaning up the city as reasons for its importance. Half of those surveyed said they participated in the old program. Those who did not were either not aware of the project (n = 3), did not live in the area (n = 3) or said distance was a problem (n = 1). Two surveys indicated that they would have liked to see more education.

There was a 100% interest in seeing a new recycling program started in the community. When asked who they would like to see run the new program, 12 mentioned the municipality; five mentioned the community's need for responsibility; two mentioned the reserve. When asked if they would be willing to separate their garbage two wrote no (10%); two maybe (10%); 15 yes (75%). When asked if they would be willing to pay for a program, four said no (20%) and 15 said yes (75%). However, three of those who said yes said they think it really is the responsibility of the municipality. Two people

mentioned that they would like to see the price be volume or weight determined. Three people gave a price, which ranged from \$2 to \$5 per month.

When asked what they do with their recyclable material now, three burn their garbage (in Cañitas and San Luis) 15%; four are currently recycling 20%, and ten or 50% send it with the garbage collection. Five people stated that they would like to see door-to-door collection as it would either be more convenient or it would determine their participation.

## **DISCUSSION**

At the moment, financing is the main confounding factor for the re-establishment of the recycling program in Monteverde. The \$20,000 to \$40,000 needed to build the recycling center is no small feat for this community. Although canvassing the local community of donors will be one means for raising the money, I believe canvassing local businesses should also be done as there are a number who are extremely interested in a community recycling program and may be extremely willing to help fund its inauguration. I believe the TSC and Municipality should also consider the potential of deriving tourist support for the project since so many expressed interest and support through my small-scale interview and various other studies have shown similar trends, including a study done by The International Ecotourism Society, which showed a large percentage of tourists willing to spend extra for environmental practices (IES, 2005). This could entail asking local businesses to enact a voluntary donation when paying for their room, purchases or entrance fees.

Before asking for donations, however, the TSC and Municipality will need to have a definitive plan. This could avoid any hesitance due to the fact that some businesses have doubts about the Municipality's ability or reliability to run the project. Therefore, the Reserve must be very assertive as to the goal of the program, the definite plans ahead & the fact that the TSC will be integral in every aspect of planning & managing the project. Environmental, financial and logistical security must be promised with any donations.

Although the project's goal is self-sustainability through the sales of the recyclable material, this most likely will not be reached immediately and will be subject to many different unknown variables. This is why evaluating the amount of both actual and potential recyclable material in the area essential. Knowing these figures could allow the planning organizations to begin further research and bargaining with potential buyers on prices. Once an estimate on possible income is made it would also give insight into the number of employees that will be necessary and an estimate on the total funding that would be needed to run the program (Diaz, Rockwell, personal communication).

Through my understanding of the market for recyclables, additional money beyond that of the thousands needed to build the project will most likely be needed at least until the project can acquire solid buyers, equipment and a reliable system. I agree with the TSC & Municipality's idea about increasing the garbage tax as a means of getting these supplemental funds. My interviews and surveys also showed a promising support for this idea with 76% of residents expressing their willingness to contribute & 67% of the businesses said yes or potentially. However, because it is the businesses that are the ones benefiting the most from the source of this waste-issue in Monteverde

(tourism), I believe the businesses should hold the bulk of the responsibility for providing this service to the community and the businesses generating the most waste are even further responsible. This is why bringing back the pay-as-you-throw (PAYT) system may be the best way to allocate the financial responsibility throughout the community.

Although pay-as-you-throw (PAYT) had many problems when in place many years ago, in a new system with better management those unsuccessful practices could be avoided (Rockwell, personal communication). A number of residents and businesses interviewed in this study mentioned bringing the PAYT system back. At the moment businesses' garbage tax is based on the amount of waste they generated only at the onset of the Municipality's garbage program. This current system does not encourage businesses to decrease their waste, as there is no yearly or monthly re-weighing of their garbage. Of course, lack of finance and resources for this system is an obstacle; the PAYT system should not be forgotten as an option for better waste management (Strauss 2007).

Organizing community input meetings to bring constituents into the decision making processes could also be a great way to create a sense of ownership, obligation, and responsibility for participating in what they helped design (Folz 1991; Ward and Gleiber 1993). Community meetings could also help with publicizing the efforts being made and reducing the amount of advertisement needed once the program has been established. Although the likelihood of many people attending these meetings may not be huge, it could give the people who are truly engaged and interested into the plan and help address potential problems and solutions.

Although the organizations planning the new project understand the importance of convenience, it must be reiterated that in order to make the program successful effort on the part of participants must be very minimal (Derksen and Gartrell 1993). Providing recycling services close to the current garbage collection system would be convenient and easy for the community to do as it would not take much extra work for them besides separating their recyclables & putting them out on the correct day. One challenge for the future project will be garnering participation in the two peripheral neighborhoods of Cañitas and San Luis. One way to encourage their participation should be by organizing a pick up system along the main road for these communities as well. The TSC and Municipality should take responsibility for either hiring someone or searching out a reliable volunteer group, such as was done with the old recycling program in San Luis with the University of Georgia's biological station taking responsibility for collecting and delivering recyclable material from the community (Diaz, personal communication).

The job of informing people of their new options & convincing them to their everyday habits will be a large part of the TSC's challenge. Initially creating publicity for the project through the formulating of brochures and sufficient advertising throughout the community will be vital. Also, bringing awareness into the schools can create a lot of the needed pressure as children have a very large influence on family practices (Ward and Gleiber 1993). In some studies it has shown that neighborhood leaders and verbal reminders can be the most effective forms of garnering participation (Derksen and Gartrell 1993, Folz 1991). It also seems that supplemental education on the problems with burning waste should also be added to education on recycling as some families in the area still practice this form of garbage disposal. The environmental and health related reasons not to burn garbage are very strong (Minnesota Pollution Control Agency, 2007).

## **Recommendations Following a Successful Establishment**

Looking into the idea of condensing some of the other small scale recycling projects that already exist in the area, but that will not be included in the future project may be an easy future addition to the project. This could include collection of car parts, scrap metal, engines, used motor oil, etc. and possibly get a larger percentage of the community recycling these materials (Rockwell, personal communication).

Decreasing the use of certain items that could be replaced with sturdy, reusable items could also be considered. For example, canvas bags and sturdy water bottles could be sold at grocery stores and tourist shops using the fact that tourists often purchase souvenirs to promote sustainable living both within the tourists & local community. A small amount of the profit from the sale of the bags/bottles could even be asked to go to local education or further sustainability initiatives. Also, since the fear of bad water is a reason some people purchase water bottles, promoting a “safe water” educational program in hotels and around town could help reduce some unnecessary waste.

Finally, working with local businesses in identifying ways in which they could reduce their waste or encourage their guests and customers to do so would be a great way to address the issue of waste at its source within the community. Providing information on efforts being made by pioneering businesses within the community could be another approach. For example, the Belmar and Heliconia both are part of the program for certification for sustainable tourism (CST) and have many sustainable practices, which may be helpful for other hotels if they were to become public knowledge. Creativity and innovation even beyond recycling are very important in decreasing the amount of waste generated within the Monteverde community.

## **ACKNOWLEDGEMENTS**

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## TABLES

Table 2. Percentages of Monteverde households (n=20) mentioning the 7 main recyclable materials they generate in their home. They were asked in two separate questions what kind of recyclable material they generate. Question #6 allowed them to fill in their response while question #13 asked them to check whether or not they had these 7 different materials (plastic, paper, cardboard, aluminum, glass, wood, food).

Monteverde Area Neighborhoods	Number of Surveys Collected
Cañitas	4
Santa Elena	5
Cerro Plano	7
Monteverde	1
San Luis	3

Table 3. Individual recycling programs for Monteverde businesses.

Business	Heliconia	Municipality	Supermercado
Structure of recycling program	They are currently recycling paper, cardboard, aluminum, plastic #1 and #2 ** generated at their hotel and 4 others (Poco o Poco, Belmar, Sapo Dorado and Fonda Vela). The material is taken to San	Currently is collecting paper, plastic, cardboard, glass and aluminum cans from about 4 businesses including Restaurante Las	Every week they take a truck full of cardboard and the plastic that their items are packaged in (not bottles) to Juntas.





## **APPENDIX 2**

### **BUSINESSES INTERVIEWED:**

#### **Tourist Businesses:**

Don Juan Coffee Tour / Cañitas

SelvaTura / Office in Cerro Plano, Canopy Tour in \_\_\_\_\_

#### **Restaurants :**

Tree House Restaurant / Santa Elena

Sofia – restaurant / Cerro Plano

Restaurante Las Palmeras / Cerro Plano

#### **Hotels :**

Hotel Miramount / Cañitas

Rustic Lodge / Cementario?

El Establo / Cerro Plano

Quetzal Inn / Santa Elena

Villa Verde / Monteverde

La Colina / Monteverde

Heliconia / Cerro Plano

Belmar / Monteverde

#### **Supermarkets:**

Mini-super / Cañitas

Supermercado La Esperanza / Santa Elena

## **APPENDIX 3**

### **BUSINESS INTERVIEW QUESTIONS:**

1. Do you think recycling is important?
2. Did you participate in the old recycling program that ended about 5 years ago?
  - a. If Yes: Did you have to deliver your material? In your opinion was it successful? Do you have any proposed improvements that could have made it more successful? Did guests/customers use the recycling option?
3. Would you like to see a recycling program established? And if so, would you like to see an educational program also?
4. Do you know how much garbage you are generating per week/month? Do you know the percentage/amount that is recyclable material? Plastic #1, glass, aluminum, paper, cardboard and organic food waste?
5. Is it important to your guests that you recycle or offer them the chance to recycle? Would they use it?
6. Would you be willing to have separate waste bins for recycling in each individual room or just in one general area?
7. Would you be willing to contribute financially to either establishing or running a recycling program? If so, how much?
8. Would you be willing to transport your recyclable material to the Recycling Center?
9. Where are you from?
10. How many guests/customers do you receive per week/day?

## **APPENDIX 4**

### **TOURIST INTERVIEW QUESTIONS:**

1. Where are you visiting from?
2. Why are you here (business, pleasure, etc.)?
3. Do you feel recycling is important? Why or why not?
4. What hotel are you staying at?
5. Would you use a recycling option if it were available to you? Would you go out of your way to recycle? (Ex; if you could only recycle at the hotel you were staying at, would you hold on to your plastic bottle until you got back?)
6. Where would you like to see receptacles placed?
7. How much and what kind of recyclable waste are you generating per day while in Monteverde?
8. Where did I interview them?

## **APPENDIX 5**

### **RESIDENTIAL RECYCLING SURVEY:**

1. In which neighborhood do you live?
2. How many people live in your house and what are their occupations?
3. How many bags of garbage do you generate per week?
4. Do you participate in the garbage collection program? Yes / No  
If yes: How far do you have to take your garbage from your house for it to be picked up?  
  
If no: Is there any way in which you would participate?
5. Do you feel it is important to recycle? Yes / No  
Why or why not?
6. What do you use that could be recycled / could not be recycled?
7. Did you participate in the old recycling program that ended about 5 years ago? Yes/No  
If Yes: In your opinion was it successful? Do you have any proposed improvements that could have made it more successful?  
  
If No: Why did you not participate? – Ex: convenience, you did not know about it, etc?
8. Would you like to see a new recycling program established? Yes / No
9. In your opinion, who is responsible for re-instituting Monteverde's recycling program?  
  
10. Would you separate your recyclable materials from your non-recyclables?  
Yes/No/Maybe
11. Would you be willing to pay for recycling, as you do for regular trash? Yes / No  
If Yes: how much? \_\_\_\_\_
12. What do you do with recyclable materials now? - throw away, burn, bury, etc.?  
  
13. How much recyclable material is in your trash? Please rate from 1(most) – 7 (least) and indicate material you do not have with an X.  
Plastic#1\_\_\_\_, paper\_\_\_\_, cardboard\_\_\_\_, aluminum\_\_\_\_, glass\_\_\_\_, wood\_\_\_\_, food\_\_\_\_?
14. If you have any other comments or need more room for other questions please write on the back!

**Thank you for your help!**

## **APPENDIX 6**

### **BUSINESSES CURRENTLY RECYCLING:**

#### **Tourist Businesses:**

SelvaTura / Office in Cerro Plano

#### **Restaurants :**

Tree House Restaurant / Santa Elena

Restaurante Las Palmeras / Cerro Plano

Kakos / Santa Elena

Morphos / Santa Elena

#### **Hotels :**

El Establo / Cerro Plano

Heliconia / Cerro Plano

Belmar / Monteverde

Poco o Poco / Santa Elena

Arco Iris / Santa Elena

#### **Supermarkets:**

Supermercado La Esperanza / Santa Elena