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ECOTOURISM AND WATER SUSTAINABILITY IN PANAMA AND COSTA RICA: A  
COMPARATIVE ANALYSIS

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## ABSTRACT

The purpose of this paper is to compare ecotourism models and water sustainability within ecotourism lodges in Panama and Costa Rica. With trends showing the rising popularity of environmentally-friendly travel, ecotourism has come into the spotlight as a debated model for sending tourists into unspoiled nature. The International Ecotourism Society (TIES) defines ecotourism as “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education” (“TIES” 2014). Social trends identified by the Center for Responsible Travel (CREST) show that the demand for sustainable travel will remain strong for the foreseeable future (Lück 2005). Currently, Costa Rica maintains its position as the forerunner in ecotourism travel in Central America, while Panama continues to make strides to compete in this niche sector of services.

For both countries, the extreme ecological diversity that has fueled their ecotourism industry, also comes with its drawbacks. Both countries have dealt with the tumultuous effects of drought and extreme flooding, thereby increasing the importance of water sustainability in the area. Through the evaluation of certification standards and water sustainability measures for a sample of ecotourism destinations, the authenticity and prospective growth of Panamanian and Costa Rican ecotourism models were compared.

Costa Rica has successfully created an ecotourism model that forms the basis of their tourism sector and provides the country with positive economic, social, and environmental returns. However, in order to maintain primacy as a worldwide leader for ecotourism, the country must be adaptable and react to not only climate changes, but to regional tourism demand changes as well.

For Panama, after analyzing the country's practices and policies, I recommend that the country invest more economically in ecotourism, am confident that with the proper practices and additional measures, emphasize tourists' safety, encourage sustainability certifications, collaborate with other countries, and advertise their unique assets. By following these recommendations, I am confident that Panama can create an ethical ecotourism model that closely resembles that of Costa Rica and that promises similar international prestige.

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## Chapter 1

### Introduction to Ecotourism

As society changes and begins to place greater emphasis on environmental awareness, sustainable tourism has become a popular alternative for adventurous travelers. There are numerous competing definitions for sustainable tourism, including: "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" ("Sustainable" n.d.), as well as "Tourism activities that respect the natural, cultural and social environment, and the values of a community, that allow the enjoyment of a positive exchange of experiences between residents and visitors, where the relationship between the tourist and the community is fair and benefits of the activity are distributed equally, and where visitors have a truly participatory attitude in their travel experience" ("Definición" 2008). However, the most widely used definition, and the one that I will be using throughout this paper, defines sustainable tourism as "Tourism that seeks to minimize ecological and sociocultural impacts while providing economic benefits to local communities and host countries" (Bien 2014). The principles of sustainable tourism can apply to any type of tourism, as well as all sectors of the tourism industry.

Ecotourism, on the other hand, is a specific subsector of sustainable tourism, which focuses on environmental and cultural preservation. The International Ecotourism Society (TIES) defines ecotourism as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" ("TIES" 2014).

To uphold prestigious standards in the worldwide ecotourism sector, TIES has created a set of founding principles to promote responsible values, which “unite conservation, communities, and sustainable travel” (“TIES” 2014). TIES suggests that every ecotourism establishment strive to uphold the following principles:

1. Minimize physical, social, behavioral, and psychological impacts.
2. Build environmental and cultural awareness and respect.
3. Provide positive experiences for both visitors and hosts.
4. Provide direct financial benefits for conservation.
5. Generate financial benefits for both local people and private industry.
6. Deliver memorable interpretative experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates.
7. Design, construct and operate low-impact facilities.
8. Recognize the rights and spiritual beliefs of the Indigenous People in your community and work in partnership with them to create empowerment (TIES).

With this set of values, TIES hopes to lay the foundation for an environmentally sustainable future for the tourism industry.

## Chapter 2

### Introduction to Costa Rica

Costa Rica lies on the Central American isthmus, situated between Nicaragua to the north and Panama to the south. The total land area for the country is 19,560 sq. miles (50,660 sq km) (Menkhaus et al. 1996), and with 12 distinct life zones, Costa Rica is considered to hold one of the highest amounts of biodiversity in the world. Within the country's borders is one of the world's most complex tropical rainforests, which boasts over 295 tree species for every 3,861 sq. miles (approximately 10,000 sq. km.) (Mok 2005). To protect such fragile ecosystems, over a quarter of the land (27%) is preserved within 29 national parks and protected areas (Menkhaus et al. 1996).

To utilize the country's unique natural resources and promote economic growth, Costa Rica has created a booming tourism sector. The rapid expansion of the tourism sector represents the principle structural change that the Costa Rican economy has experienced since 1990. Within the productive agenda favored by commercial liberalization and incentive policies, tourism stands out among the activities with the highest performance and currently represents one of the country's principle economic activities generating foreign currency (Mok 2005). For many years, leading up to 2008, Costa Rican tourism experienced steady growth in its direct contribution to GDP. However, in 2009 and 2010 Costa Rica's GDP dropped ("Travel & Tourism: Economic Impact 2015 Costa Rica" 2015), most likely due to the world recession that struck in 2008 and limited travel opportunities for many people. Tourism's direct contribution to GDP was expected to rise by 2.8% in 2015. By 2025, it is forecasted to rise another 4.7% over current levels ("Travel & Tourism: Economic Impact 2015 Costa Rica" 2015). While these figures represent

Costa Rican tourism as a whole, it is important to evaluate these data when analyzing the importance of ecotourism, the country's largest sector of tourism.

### **History of Ecotourism in Costa Rica**

Costa Rica's emphasis on tourism began in the 1950s with the foundation of the Costa Rican Tourism Institute (ICT, its Spanish abbreviation). The rapid expansion of the tourism sector represents one of the principle structural changes that the Costa Rican economy has experienced. Since launching its ecotourism initiatives, the country now receives about 2 millions tourists per year, with the majority coming from the United States. In fact, some of these tourists love the country so much that they remain there permanently; about 100,000 U.S. citizens currently live in Costa Rica (Serrano 2016).

Costa Rica's push towards becoming an ecotourism giant resulted from numerous chain reactions, starting with a sequence of political movements. In 1986, Costa Rica's President, Oscar Arias, appointed Alvaro Ugalde, a well known environmentalist, to his council. Ugalde, along with other biologists and environmentalists, came up with idea of creating a system of national parks along the volcanic corridor. During this time, the United States was securing diplomatic relations with Costa Rica in an attempt to combat Central American communism. For over 50 years, the U.S., through its Agency for International Development (USAID) gave Costa Rica millions of dollars per day in assistance to stabilize the country, ensure democracy, and promote peace. After the country's stabilization, the United States further promoted Costa Rica's conservation agenda by compromising on a tradeoff: Costa Rica did not need to repay its full debt from U.S.'s previous aid if that money was invested in nature parks and conservation efforts

(Campos 2016). The creation of the biological corridor anchored the future vision of nature-based tourism.

Following this string of events, which emphasized the preservation of Costa Rica's environment starting the mid-1980's, the ecotourism sector began to emerge. Tourism saw a push for innovative nature and adventure activities geared towards North American and European markets. Ecolodges began to spring up in the jungle, and tours with specialized naturalist guides and operators positioned Costa Rica as a leading ecotourism destination worldwide by the 1990s (Serrano 2016). The ICT wants to continue to advance Costa Rica's ecotourism success with the vision that "by 2021, the ICT will have established itself as rector of tourism in Costa Rica, ensuring a model of sustainable, unified, and equitable tourism development that, by means of innovation, development of human resources, and effective public management, can foster new opportunities for tourism development that contributes to improving the competitiveness and quality of life to which we aspire as a nation" ("¿Quiénes Somos?" 2015). Furthermore, the ICT has designated a specific government agency, the Department of Tourism Certifications and Social Responsibility, to oversee the sustainability issues. The department's responsibilities include monitoring programs such as the Certification for Sustainable Tourism (CST), (explained in Chapter 6) ("Sostenibilidad" 2015). Costa Rica's initiatives for preserving its biodiversity, developing its tourism industry, and promoting sustainability will lay the foundation for further ecotourism advancement in the future.

## Chapter 3

### Introduction to Panama

Panama is the southernmost country in the Central American isthmus, with Costa Rica bordering it to the north and Colombia to the south. The country's narrowest geographical point is bisected by the Panama Canal, which provides a crucial trade route and waterway between the Caribbean Sea and Pacific Ocean. The total land area of the country reaches approximately 29,340 sq mi (75,991 sq km), with 20.6% of the land reportedly designated as protected land areas in 2012 in order to protect its vast ecological diversity and unique flora and fauna ("Panamá: Datos" 2016). Similar to Costa Rica, Panama wants to capitalize on its unique natural resources through the expansion of tourism.

Economically, Panama relies heavily on the service industry to uphold its GDP, with tourism being one of the top three service industries generating revenue. Recently, Panama has become one of the most stable economies in Central America, and one of the cheapest in cost of living. This, along with the government's push to take advantage of sustainable tourism and ecotourism, is creating a persuasive tourist destination. Up until the global recession during 2008, Panama's tourism industry had experienced steady growth with increasing contributions to the nation's GDP. The "great recession" did produce a significant lull, from which Panama was able to quickly recover. In fact, the direct contribution of tourism to Panama's GDP was forecasted to rise by 1.3% between 2014 and 2015, with potential to grow another 4.7% by 2025 ("Travel & Tourism: Economic Impact 2015 Panama" 2015). Similar to Costa Rica, while these figures represent Panamanian tourism as a whole and not specifically ecotourism, it is important

to understand these trends, especially with the government's push for sustainable tourism and ecotourism as a main source for growth within the industry over the past few decades.

### **History of Ecotourism in Panama**

The first government attempt to organize tourism in Panama date back to 1934, with the creation of the National Tourism Commission, composed entirely of private sector representatives, whose main purpose was to promote the arrival of foreign visitors to the country. However, it was not until the 1960s that Panama's image as a tourism destination began to develop, due primarily to the creation of the Panamanian Tourism Institute (IPAT) ("Información" 2016). Since the creation of IPAT, Panama has welcomed increasing numbers of international tourists. Today, the country receives around 1.05 million tourists per year, an increase of over one million per year from just a decade ago. The majority of these foreign visitors hail from the United States, followed by Colombia, its southwest neighbor ("Dirección" 2015). The country's efforts to develop ecotourism within recent years may have contributed to this impressive growth.

Panama has made significant strides recently in promoting sustainability within the tourism sector, especially promoting ecotourism. In 2007, Panama launched the "Sustainable Tourism Master Plan" (STMP). This 13-year program, with total funding exceeding \$575 million, aims to promote sustainable tourism development through the improvement of national and regional institutions (human resource development, research development, better planning of industry and government, etc), as well as local institutions (community development). The STMP also strives to ensure that the economic benefits from sustainable tourism development

reach all sectors of the country. Finally, it plans to strengthen and streamline the tourism sector by 2020, generating a substantial increase in income and employment in tourism from the national to local level (“Plan” 2008). The SMTP was implemented to ensure the long-term viability of sustainable tourism as a whole, but due to Panama’s rich ecological diversity, further actions have been taken to tap into ecotourism’s niche opportunities. From the ecotourism sector, the STMP aims to enhance Panama’s worldwide reputation as an ecotourism destination by integrating its efforts with those of its neighbor, Costa Rica, and attracting some of the demand for this destination.

Panama’s Master Plan for ecotourism also called for the development model in parks and protected areas in Panama (“Plan” 2008). To facilitate the achievement of this objective, in April 2015, on the day declared World Earth Day, Panama announced an initiative known as “ECOTUR-AP”. This interagency program combines the efforts of Panama’s Ministry of Environment and its Tourism Authority, whose united purpose is to find a low-impact ecotourism development model in the protected areas of Panama, as a mechanism to support the sustainability of its biodiversity (Canto 2016). Furthermore, the initiative “is premised on granting concessions in protected areas of the country for the development of infrastructure that will help to enhance ecotourism in the Panamanian Isthmus”. The project allocates funds from a variety of sources, with around \$4 billion coming from the International Development Bank and its partner, the Global Environmental Facility, and \$1.5 billion from national public contributions, NGOs, and private businesses. The work is to be completed in nine protected areas: Baru volcano, Bastimentos Island, Coiba National Park, Omar Torrijos National Park, Altos de Campana, Soberania National Park, Chagres National Park, Portobelo National Park, and the protected forests of San Lorenzo (Jiménez Comrie 2015). For Panama, capitalizing on

the rising demand for ecotourism will allow for increased revenues, that the Ministry of Environment can use to more tightly regulate areas developed for public use and promote further environmental protection. These initiatives should continue to advance Panama's ecotourism sector for future generations while preserving the country's environment.

## Chapter 4

### Current Trends in Ecotourism

As more and more ecotourism destinations spring up every year all around the world, one might worry if this growth is sustainable over the long term. However, certain social trends identified by the Center for Responsible Travel (CREST) show that the demand for sustainable travel will remain strong for the foreseeable future (Lück 2005). The CREST outlines the following points as explanations of the trends that CREST observed:

- 1) Attitude shifts by generation: The “Baby Boomer” generation (those born between 1946 – 1964) has entered retirement and “boomers” have finally found themselves with more leisure time and discretionary income. With nearly 80 million Baby Boomers in the United States controlling 70-80% of the wealth, living longer, becoming increasingly aware of environmental concerns, and now valuing active lifestyles, they have become a huge target market for sustainable travel. In addition, subsequent generations seem no less promising for this industry. Those born between 1961-1981, or “Generation X”, are largely environmentally aware and even more conscientious consumers than their predecessor generation. For the young adult generation of “Millennials”, the children of the Baby Boomers and born from the early 1980s to 2001, environmental and social justice issues are of paramount importance and they are generally very well-informed about these topics. These three generations of tourists interconnect, with each influencing the others and fueling the demand for responsible tourism.

- 2) Urbanization: Around the world, human migration trends have seen a heavy influx of people leaving rural areas to seek employment cities. Unfortunately, this human movement trend is also leading to greater physical and environmental stresses, such as the increase of urban population densities, traffic congestion, air and noise pollution, and loss of green space. This urban population lives predominantly in artificial environments, spending most of their days in climate-controlled workplaces and apartments, commutes in automobiles, buses, or subways, and devoting much of their leisure time to the artificial environment of computer screens and wireless devices. This lifestyle inspires a desire to “reconnect with nature” and pushes many to spend their vacations in pursuit of that goal, a trend described below.
- 3) Connecting to nature: Due to the increase of trend “b”, urban workers, as well as many other people seek to spend their leisure time in vacation destinations where they can ‘reconnect with nature’. Adventure activities, such as hiking, camping, wildlife viewing, snorkeling, and scuba diving, all have shown increased popularity trends since they offer vacationers a chance to separate entirely from busy work schedules and urban environments.
- 4) Demand for authenticity: Trends have shown that modern consumers want authentic experiences in comparison to more contrived leisure experiences, such as theme parks, cruise lines, resorts, etc., that mainly focus on manufactured attractions and material consumption (shopping, gambling, etc.). Today, travelers want to see natural places and experience the real world, rather than invest in manufactured or mass-produced entertainment.

- 5) Going green: Finally, as consumers become more savvy and well-informed on environmental issues, the demand will continue to increase for products that are seen as “sustainable”, “environmentally friendly”, “green”, or any other type of product or service that promotes care for the environment (Lück 2005).

In addition to these trends, which provide an optimistic outlook for the future of the ecotourism industry, researchers from the Costa Rican Tourism Board have identified the “ideal” demographic of prospective customers from the United States. This group includes those who are both experienced travelers with a high level of education and take into consideration sustainability and environmental preservation. The Costa Rican Tourism Board found that around 40% of their ideal prospects feel inclined to visit countries and destinations that boast sustainable tourism practices. In addition, 54.3% are inclined to pay more for services and products that have a lower impact on global warming (Castro 2014). Furthermore, Lifestyles of Health and Sustainability (LOHAS), a non-profit research group, found that 19% of adults in the United States—some 41 million people--fit the profile of “conscientious consumers” (Lück 2005). The immensity of these figures shows the vast demographic of ecotourists, both returning and potential, and suggests their impact on the industry.

### **Future Trends in Central American Ecotourism**

In addition to understanding trends in the ecotourism industry, it is important to examine how global political changes may influence the future potential for ecotourism in Costa Rica and Panama. As mentioned previously, the main demographic of foreign tourists to both countries hail from the United States. With recent changes in U.S.-Cuban diplomatic relations allowing

U.S. citizens to travel directly to Cuba for the first time in decades, tourists and developers are now likely to be drawn to Cuba as a new travel destination (Campos 2016). While Cuba currently lacks a strong ecotourism sector, experts say that it would be very easy for them to pick up the Central American model. Such a strategy would target primarily U.S. tourists. Europeans have always been able to travel freely to Cuba, so their numbers are not likely to show a sudden increase. However U.S. travelers, who now have shifting attitudes and an opportunity that had been closed to them for decades, may cause Central American tourism to suffer in the near future.

This change of focus in United States travel preferences, paired with escalating competition, may be the first blows to Costa Rica's primacy in the ecotourism sector (Campos). Panama and other neighboring countries have also stepped up the development of their ecotourism sectors. Experts from both the Organization of American States and ECOTUR-AP have confidence in Panama's ability to create a booming ecotourism industry. Panama already has a good foundation, as a developing nation with good infrastructure in Panama City to bring in tourists. In addition, the Panama Canal generates huge amounts of capital for the country, which they can invest into expanding ecotourism (Campos 2016). Moreover, as an added value, Panama could pair their ecotourism experiences with the cultural value of having a vibrant indigenous population, something that Costa Rica cannot offer to the same degree (Canto 2016). Panama is fortunate in having economic stability, along with rich biodiversity and cultural diversity, that provides all the necessary ingredients to become a huge competitor in ecotourism in the future.

However, the dominant regional power is not likely to fade. Representatives from the Costa Rican Embassy in Washington D.C. say that Costa Ricans remain hopeful in their outlook

of maintaining primacy (Serrano), because steps can be taken to minimize detrimental impacts to their tourism economy should it become necessary to do so. For example, Costa Rica could help Cuba develop an ecotourism platform in exchange for future economic favors. In addition, there have already been programs enacted among Costa Rica, Panama, and other Central American countries to act cooperatively, instead of competitively, in the ecotourism sector. The Central American Tourism Integration System (SITCA) currently strives to make travel to Central America a one-system approach (meaning, for example, that one would arrive in Panama, travel through Costa Rica, then explore Guatemala, etc.) in order to maintain friendship among the respective tourism sectors of Central American nations (Campos 2016).

SITCA's board, the Central American Tourism Council (CCT, its Spanish abbreviation) currently includes representatives from seven Central American nations. The CCT has become increasingly important in the past two decades, as the Central American countries have shifted from agrarian to predominantly service-based economies. The main objective of this council is "to facilitate and promote the development of tourism in the Central American region, thereby promoting the integration of this industry as a strategic sector in each country in order to contribute to sustainable tourism development in the region" ("Consejo" 2009). The CCT further aims to remove all obstacles to the free movement of people in the region, as well as integrate the promotion of tourism as a state function, with the other national and regional government agencies, so that in the respective cases of each member nation, greater efficiency may be achieved in tourism development efforts throughout Central America ("Consejo" 2009). If successful, SITCA's efforts will not only mitigate the potential decline of Costa Rica as a leading ecotourism destination, but also promote the prosperity of ecotourism in Panama and other Central American nations

## **Chapter 5**

### **Criticism of Ecotourism**

Tourism, in any form, poses an extensive range of potential impacts on the environment. To understand the complexity of this emerging sector of tourism, I will present the topic from varying perspectives. This chapter will explore the critiques of ecotourism, focusing on inevitable environmental impacts and false advertising of ecotourism establishments that have led to the sectors muddled reputation, proceeding in the next chapter with the certification steps that are promoted to uphold the integrity of the ecotourism sector and promote its positive longevity. The following points provide an overview of some of the negative effects of tourism on the environment.

- 1) Disturbance to wildlife and habitats: Most tourists who visit remote areas come with high expectations to observe the indigenous flora and fauna. However, any human presence in what are often delicate ecological areas can disrupt the normal behavior of animals, potentially affecting mortality and reproductive success.
- 2) Destruction of habitats and landscape changes: The physical space that a lodge must clear to accommodate guests and other tourist facilities creates one of the greatest alterations to habitats and landscapes. In addition, the extraction and use of building materials (sand from beaches, stone reef limestone, wood, etc.) can destroy animal habitats and landscapes if not done responsibly.

- 3) Visitor “wear and tear”: General daily activities by guests can also lead to inevitable impacts on the surrounding lands. For example, hiking paths that are consistently traveled on can lead to increased erosion in those areas.
- 4) Sanitation and waste management: With an influx of visitors arriving to a generally remote area, lodges must learn how to best handle the generation, and disposal of wastewater, sewage, solid waste (garbage) and chemical waste. While generation of this waste may be necessary for the upkeep and maintenance of the lodge, it can be harmful to the surrounding animals and plants if disposed of improperly.
- 5) Water demand: A tourism lodge requires water resources to accommodate for the health and comfort of its guests, as well as the maintenance and daily upkeep of its facilities. Heavy water usage may lead to deterioration of water quality through water pollution in both freshwater and coastal water sources, and cause damaging eutrophication--the over-enrichment of an aquatic ecosystem with chemical nutrients usually containing nitrogen or phosphorus--of aquatic habitats. (Case studies on how well ecolodges have promoted water sustainability will be evaluated in a later chapter.)
- 6) Transportation: Many ecolodges are located in remote areas that are difficult to access. This remote feeling is often desirable, but unless the lodge has taken steps to minimize the environmental impacts of vehicular traffic, this extra travel can result in an increase of pollution and greenhouse gases produced by motorized travel with local, national and global impacts (Davies et al. 2000).

The founding principle of ecotourism, as suggested by TIES, is to minimize these impacts as much as possible. However, some argue that ecotourism is an oxymoron, as any form

of travel involves activities that are inherently detrimental to the environment. In addition, ecotourism lodges, while among the most environmentally-conscious establishments in the tourism sector, tend to face even harsher criticism regarding environmental impacts due to their locations in fragile ecosystems. (The measures taken to legitimize ecotourism's minimal environmental impact and an exploration of case studies to evaluate ecotourism's impact in terms of water sustainability will be explored in later chapters.)

### **False Advertising**

There have been many cases of ecotourism businesses that earned a bad reputation for exploiting local nature and culture solely for financial gain, resulting in many true ecotourism establishments receiving the negative backlash of a muddled reputation due to the problem known as "greenwashing". The term "greenwashing" is used to explain a business that presents itself as sustainable and environmentally friendly, when in reality it does not comply with TIES's generally accepted founding principles, or worse, fully contradicts those principles (Bien 2008). This mainly occurs with the erroneous lexical interchangeability of "ecotourism", versus "nature-based tourism". Clarifying the differences between the two, "nature-based tourism does not need to be consciously benevolent in nature, implying that it is tourism within a natural landscape. By contrast, to be certified as true ecotourism, the establishment is well prepared, sustainable for the long-term, and follows certain ethical standards" (Sundström 2003). Unfortunately, there are currently no strict rules in place to ban a nature-based establishment from advertising itself as an ecotourism destination (Sundström 2003), so many true ecolodges are painted with the "greenwashing" brush and suffer a damaged reputation and unfair competition.



## Chapter 6

### Overview of Certification

To separate ecolodges from other forms of nature tourism, many true ecolodges apply for certifications to bolster their prestige and integrity. The certification process is a voluntary procedure that evaluates, audits and gives a written guarantee that the facility, product, process, or service complies with the set standards. (“TIES” 2014) The purpose of the certification process is to “establish standards and help to distinguish genuine ecotourism businesses from those making false claims” (Bien 2008). Therefore, when a company meets or exceeds the baseline certification standards it is awarded with permission to use a marketable logo to prove its authenticity to potential clients.

Benefits of certification extend not to just the certified business, but also the government, guests, and the surrounding environment and communities. For the business, certification provides a marketing tool to distinguish its facility and services from the rest. However, it also is an educational process to help teach the company the elements of sustainability and methods to change their operations in order to optimize efficiency and attract more clients. From a consumer standpoint, the guests of eco-certified lodges tend to not only receive higher quality service, but also learn how to make environmentally-conscious choices on their own to increase their awareness of important environmental topics. Certification eases certain stresses for governments as well, as the process naturally raises the standards for health, safety, environment, and social stability. The process also protects the country’s niche market as a reputable ecotourism or sustainable tourism destination, thereby securing this economic sector and raising

GDP (Bien 2008). While numerous certification programs exist in Central America, the emphasis on and popularity of their use vary by country.

### **Sustainable Tourism Certification Program**

Costa Rica, as a worldwide leader in ecotourism, places strong emphasis on certification. Due to its having over a quarter of its lands reserved in protected areas, Costa Rica places strict regulations on tourism facilities. Therefore, regardless of whether an establishment touts itself as an “ecotourism” destination or not, it must achieve the proper certifications for construction and use as a tourist facility. To mitigate the frequency of greenwashing, however, starting in the late 1990s, the Costa Rican Institute for Tourism (ICT, again, the Spanish abbreviation) launched the Sustainable Tourism Certification Program, one of the first governmental initiatives by a developing country to set ethical standards specifically for ecotourism. Since 1997, the program has granted a Certificate in Sustainable Tourism (CST) to those lodging establishments whose operations have surpassed the established standards of sustainability in regards to the management of natural, cultural, and social resources. The certifications were also awarded to tour operators starting in 2000, car rental agencies and car companies in 2011, and even theme park certifications started in 2012. The ICT consistently updates certification standards every year, and while it is not mandatory, it is a prestigious prize for a company to receive these stars for their efforts (Serrano 2016).

The Certificate of Sustainable Tourism was an initiative developed:

...as a framework to ensure (voluntarily) compliance with highest environmental standards throughout the construction and operation of hotels and to provide a

competitive advantage to hotels with the highest level of performance... The program is innovative, practical, and has been recognized as potentially the best environmental certification system for hotel in existence, to such an extent that there is interest in its possible implementation in the Caribbean, southwest Asia and Sweden (Fürst 2002).

The certification process utilizes a questionnaire to inspect four main areas of sustainability:

- 1) Physical and biological environment: Evaluates how the company interacts with the surrounding natural environment, inspecting factors such as sewage treatment, protection of flora and fauna, among others.
- 2) Building Services: Evaluates aspects of internal systems and business processes, such as waste management and the use of technologies for saving electricity and water.
- 3) External client: Evaluates the actions taken by management to invite the client to participate in the company's sustainability efforts.
- 4) Socio-economic environment: Evaluates the interaction of the company with adjacent communities analyzing, for example, the extent that the hotel responds to the growth and development in the region through job creation and profit attainment for the community ("En Qué Consiste El CST?" 2014).

While not recognized as a universal standard, nor the only certification program available, it is the primary tool for ecotourism certification in Costa Rica and provides those companies achieving the high standards of sustainability with, arguably, one of the best financial and ethical returns available in the ecotourism industry.

Unfortunately, the Costa Rican CST is not directly transferrable to every other country. Since Costa Rica's ecology has its own unique characteristics, the sustainable practices necessary to fit that country's environment cannot simply be "copied" (Serrano 2016). However, the CST provides a good model for other nations to adapt, due to its formula that allows lodges to be ranked at different levels and creates pressure for innovation in the ecotourism sector. (Campos 2016). Therefore, although the CST was created specifically for the Costa Rican government's agenda to amplify the tourism demand, surrounding countries could still use Costa Rica's evaluation procedure as a basis for their own ecotourism models and certifications (Serrano 2016) .

## Chapter 7

### Water Sustainability and Conservation

Such extreme ecological diversity comes as both a blessing and a curse, as Costa Rica and Panama are experiencing some of the most visible effects of climate change. While Panama and Costa Rica are not exactly ecologically identical, they do share many similarities. Both countries have dealt with the tumultuous effects of drought and extreme flooding, thereby increasing the importance of water sustainability in the area.

Many uninformed people assume that potable water is always bountiful in countries like Costa Rica and Panama, which are known for their lush tropical rain forests. Unfortunately, this is not always the case. As mentioned in Chapter 2, mountain ranges create the spine of Costa Rica and divide the country between the Caribbean side and Pacific side. Trade winds, which blow in from the eastern side, bring rain to the mainland, however these rains are unable to pass over the mountain. This makes the eastern side near the Caribbean Sea very humid and lush, but unfortunately makes the western, Pacific side very dry. In fact, the Caribbean side of Costa Rica holds 70% of the country's water, while the Pacific side only holds 30%. During El Niño years, the weather patterns become even more extreme, with the Caribbean side enduring greater rainfall and the Pacific side becoming even drier (Campos 2016).

In Costa Rica's Guanacaste region on the northwest Pacific side, the people have been living with droughts since 1937. Because of this, the government does not give permits to dig wells in that region (Serrano 2016). Therefore, water companies in the country face the complicated challenge of collecting water resources from the east and transporting them to

communities and tourism areas in the west. The creation of Lake Arenal, which will be explained further in Chapter 9, is an example of one such project.

Not only are these water resources important for the obvious reason of daily human activity, but both Costa Rica and Panama rely heavily on a concept called the “water-energy nexus”, which is a term for the interrelationship between water and energy. In Costa Rica and Panama, the water-energy nexus uses water to create not only energy, but to also provide many other important resources. For example, the Costa Rican water companies that transport surface water via canals to the communities and tourist areas in Guanacaste region also work closely with the energy sector in harnessing hydroelectric power. Thus, the Arenal Dam was created with hopes of using the country’s water resources to benefit energy resources as well. By doing this, Costa Rica has used one resource to benefit many others. It provides potable water to the local communities, facilitates tourism to exist in dry regions, irrigates agricultural lands, and generates electrical power (Campos 2016).

Similar to Costa Rica, Panama has been facing droughts due to climate change and El Niño events that put pressure on their water resources, making water sustainability and conservation measures even more important. While the country’s topography is not as distinctly divided as Costa Rica’s, it still has its share of drier areas, especially in the Azuero Peninsula, aptly nicknamed “the Dry Arch” (Esquivel R. 2016). The Azuero Peninsula encompasses the Pacific regions of Herrera and Los Santos. This area, besides having lower recorded rainfall than the rest of the country, has dealt with crippling deforestation over the past 30 years, exacerbating its drought problems (Canto 2016). Temporarily tapping into subterranean deposits is an option, but the ground water contains small concentrations of salty minerals. When used for farming, most the water evaporates during irrigation, leaving salt deposits that, when concentrated over

time, can destroy crops. Collecting rainwater during the wet season and storing it underground to minimize evaporation for later use during the dry months is one recommended option (Esquivel R. 2016).

The urban areas of Panama also need to deal with added stresses from droughts. In Panama City, where more than 75% of the country's population resides, water shortages mostly stem from problems surrounding distribution and leakage (Canto 2016). As briefly mentioned before, Panama also implements the use of the water-energy nexus to harness its water resources for multi-purpose use. The Panama Canal not only allows ships to pass through this water corridor for travel and trade, but also generates power and provides potable water to people in Panama City. While it requires more water, the government has concluded that using the Panama Canal as a water-energy nexus is the most efficient system for generating power. They have calculated that even though it is a much bigger project, it is 7% more efficient than their previous system (Campos 2016). However, by using water to create other resources, it means that droughts not only affect the water supply, but all other sectors that rely heavily on this resource. For example, in the past, the droughts in Panama have not only limited the size of ships able to enter the canal due to the lower water depths, but have also caused power shortages, since there is less water to generate energy (Melendez 2013).

However, Panama has seen some positive changes in spite of the 2015 El Niño phenomenon and droughts. Today, Panamanian awareness has changed for the positive, insofar as water has become important in the thinking of the majority of Panamanians. Likewise, the state has taken the lead in the issue. Currently, the government has been structuring the National Plan for Water Security, which is a state policy act with the force of law. The act will create a plan to address Panama's water issue for at least the next 20 years (Canto 2016). History and

current climate trends show the importance for these countries to practice sustainable methods regarding their water resources.

### **Water Conservation and Sustainability in Ecotourism**

The following chapters will focus on specific case studies of ecotourism destinations throughout Panama and Costa Rica to get an idea about the water conservation and sustainability measures that these lodges have implemented. Throughout the past year, I have corresponded with ecotourism destinations in the region and administered surveys regarding water consumption, sustainability, and conservation. Appendices A and B show copies of the initial and follow-up letters, translated into English, and a translated copy of the survey that I administered can be found in Appendix C.

To evaluate the results from these lodges, I have decided to seek a third-party source as a basis for my analysis. This will eliminate any fear that the use of a country-biased certification, such as the CST, that may skew my results in favor of ecotourism lodges from one specific country. As a basis for analysis of my results, I have decided to use criteria from the Universidad Nacional Agraria La Molina, an agricultural university in Peru that offers a special Masters program in ecotourism. In their course module, “Fundamentals of Hospitality and Ecotourism Operations in Natural Areas”, they provide recommendations for actions that an ecotourism establishment should take to improve water sustainability. Using these recommendations as a basis, I compared the following aspects in the survey results from each ecolodge:

Table 1 "Fundamentals of Hospitality and Ecotourism Operations in Natural Areas" Evaluation Table (XI Módulo)

| Yes | No | N/A | Recommended Criteria                              |
|-----|----|-----|---|
|     |    |     | Treat and reuse wastewater                        |
|     |    |     | Use consumption regulators in faucets             |
|     |    |     | Use consumption regulators in showers             |
|     |    |     | Reuse rainwater                                   |
|     |    |     | Offer education on sustainable practice to guests |

It should be noted that for the recommended criteria, “Offer education on sustainable practice to guests”, I have amended this factor from simply, “Propose to customers to reuse towels and sheets,” as I wanted to include sustainable education programs as a whole, which I feel promotes a larger scope of sustainable practices. I plan to use these recommendations as a checklist point to see where the ecolodge has been succeeding in their sustainable practices, and where they still have room for improvement. In addition, I plan to look at the technical installments of bathroom fixtures and irrigation systems to evaluate whether the ecotourism facility is using the most efficient water-saving options, as recommended by the “Savings and Efficient Consumption of Water in Business: Employee Operation Guide” (Muñoa Blas 2010).

Table 2 "Conservation and Efficient Consumption of Water in Business: Employee Operation Guide" Evaluation Table (Muñoa Blas)

| Installation Type: | Least Water Efficient Option: |  | Average Water Efficient Option: |                 |                   | Most Water Efficient Option: |                          | N/A |
|--------------------|-------------------------------|--|---------------------------------|-----------------|-------------------|------------------------------|--------------------------|-----|
| Irrigation System  | Sprinkler System              |  | Drip Irrigation System          |                 | Programmed System |                              | Ditch Irrigation System  |     |
| Faucet             | Center Set                    |  | Single-Hole                     |                 | Motion Sensitive  |                              | Push Button              |     |
| Faucet Additions   | Aerator                       |  |                                 | Flow Restrictor |                   |                              |                          |     |
| Shower Additions   | Aerator                       |  |                                 | Flow Restrictor |                   |                              |                          |     |
| Toilet             | Overhead Tank & Pull-Chain    |  | Flushing Lever Tank             |                 |                   |                              | Dual Button Flush System |     |

When reviewing evaluations multiple factors must be considered for analysis. Four ecolodges fully responded to the surveys and form the basis for my analysis. We recognize this is a restricted sample and therefore, note that the practices of these lodges do not represent the entirety of the ecotourism community in Costa Rica and Panama. In fact, many ecolodges did not respond to my surveys. This could have occurred due to a lack of incentive, or perhaps that these establishments did not want the negative publicity if they do not meet the set standards or they simply did not have time to respond.

Secondly, the questions in the surveys do not fully cover all aspects of water sustainability and conservation. We did this to keep the survey brief in hopes to increase the number of respondents. Furthermore, many of the tools used to measure water sustainability require in-person audits. For example, exact measurements of water usage may be unknown to the company without a professional evaluation. Because I could not audit the lodges first-hand, I am limited in the scope of data that I have for evaluation..

While numerous factors limit my ability to form conclusions about the overall state of water sustainability and conservation in Panamanian and Costa Rican ecolodges, the following evaluations will supply us with a sliver of insight on four popular ecotourism destinations. The analysis will show the methods that each lodge uses to practice good use of water resources, provide insight on the credibility of the lodge as a true ecotourism destination, and exam location factors that may influence each lodges water usage.

## **Chapter 8**

### **Costa Rica Case Study #1: Hotel Belmar**

Hotel Belmar, founded in 1985, sits on a 9-acre property in Costa Rica's cloud forest, in the mountains of the Monteverde Reserve. It is also a part of the Bellbird Biological Corridor, a natural corridor connecting the lowland forests with the temperate cloud forest. Although Hotel Belmar lies on the Pacific side of Costa Rica, its location in the Monteverde Cloud Forest alleviates some pressures on water resources. Because it is not located in the Guanacaste region, it has a more temperate climate as well as the access to well water.

Hotel Belmar was the first company in this Monteverde to join the Sustainable Tourism Certification Program, and was awarded with one "leaf" in 2002. The "leaf" system ranks those who have successfully passed the CST on a scale from one to five. Since then, it has advanced its sustainable practices and was certified with five leaves in 2011, making Hotel Belmar currently

the only hotel in Monteverde Reserve with a 5-leaf sustainability certification (“Certificate” n.d.).



Figure 1 Location of Hotel Belmar (via Google Maps)

Hotel Belmar houses just under 14,000 guests (13,977) on average per year, and currently employs 52 workers. There are 32 restrooms on site for use of staff and guests. Hotel Belmar uses approximately 7,573,813 gallons (28,670 m<sup>3</sup>) of well water per year. The lodge attempts to cut water costs by eliminating swimming pools, however it does water its vegetable garden through the use of a sprinkler irrigation system. Inside the ecolodge’s restrooms, kitchen, etc. are single-hole faucets mounted in every sink, with flow restrictors installed to reduce the amount of water exiting the faucet. Restroom toilets are equipped with a dual button flush system, and the showers also use similar flow restrictors as the faucets. To further promote sustainability, Hotel Belmar offers educational programs about water sustainability for guests, has rainfall catchment to collect water, as well as an anaerobic digester to treat grey water for sewers and biogardens. To increase awareness, this process is explained to guests during sustainable tours (Appendix D).

| Yes | No | N/A | Recommended Criteria                              |
|-----|----|-----|---|
| ✓   |    |     | Treat and reuse wastewater                        |
| ✓   |    |     | Use consumption regulators in faucets             |
| ✓   |    |     | Use consumption regulators in showers             |
| ✓   |    |     | Reuse rainwater                                   |
| ✓   |    |     | Offer education on sustainable practice to guests |

Table 3 "Fundamentals of Hospitality and Ecotourism Operations in Natural Areas" Results for Hotel Belmar

| Installation Type: | Least Water Efficient Option: |   | Average Water Efficient Option: |   |                          |  | Most Water Efficient Option: |  | N/A |
|--------------------|-------------------------------|---|---------------------------------|---|--------------------------|--|------------------------------|--|-----|
| Irrigation System  | Sprinkler System              | ✓ | Drip Irrigation System          |   | Programmed System        |  | Ditch Irrigation System      |  |     |
| Faucet             | Center Set                    |   | Single-Hole                     | ✓ | Motion Sensitive         |  | Push Button                  |  |     |
| Faucet Additions   | Aerator                       |   |                                 |   | Flow Restrictor          |  | ✓                            |  |     |
| Shower Additions   | Aerator                       |   |                                 |   | Flow Restrictor          |  | ✓                            |  |     |
| Toilet             | Overhead Tank & Pull-Chain    |   | Flushing Lever Tank             |   | Dual Button Flush System |  | ✓                            |  |     |

Table 4 "Conservation and Efficient Consumption for Water in Business" Results for Hotel Belmar

### Evaluation of Survey Results

Looking at its history, Hotel Belmar appears to have made impressive strides in sustainable practices over the years, as seen in the increase from one leaf to five leaves over ten years. Although receiving the award of one leaf is still a notable achievement, this lower-level rating may have served as an incentive for Hotel Belmar to strengthen its commitment to sustainable practices. In addition, as mentioned in earlier chapters, Costa Rica's Certificate for Sustainable Tourism increases a hotel's credibility by reducing the chance of greenwashing.

Because this hotel has been certified, I can confidently conclude that Hotel Belmar is a true ecotourism destination.

With a study of Hotel Belmar's water usage, their efforts to implement sustainable practices become even more apparent. Hotel Belmar has excelled by completing all the recommended criteria on the "Fundamentals of Hospitality and Ecotourism Operations in Natural Areas" checklist. Of all the ecolodges examined, it is the only one that has successfully implemented all of the evaluated criteria. Their alternative sources of water, such as the rainfall catchment and their grey water recycling system, help offset much of their well water usage, and their additional water-saving installments help conserve total water consumption.

However, to further improve water conservation and sustainability practices in Hotel Belmar, the lodge may want to consider upgrading their irrigation system to a more environmentally friendly one, or better yet use recycled water to eliminate water consumption from their irrigation system all together. (It is important to consider, however, that irrigation is solely used for watering the vegetable garden. Growing their own crops is a very sustainable practice that may actually reduce overall energy and water use). In addition, Hotel Belmar may consider investing in dual-button toilets to increase their water savings in the bathrooms.

Overall, the hotel has implemented an impressive amount of sustainable features based on the data I have collected. While there is always room for improvement, my comparison of Hotel Belmar's survey results to the those of other ecolodges in upcoming chapters, leads me to conclude that this hotel has made the biggest effort to practice good water sustainability and conservation methods.

## Chapter 9

### Costa Rica Case Study #2: Rancho Margot

Rancho Margo lies on 400 acres in the El Castillo region of Costa Rica at the base of the Arenal Volcano and Lake Arenal, and a short drive from the town of La Fortuna (Figure 2 ). The land, purchased in 2004, was previously used for cattle farming and for dairy production. However, under new ownership the vision has changed from agricultural production to reforestation, with plans to replenish and diversify the rich flora and fauna (“Historia” 2014). From its founding in 2004 to its certification just eight years later, Rancho Margot had made such valiant strides in the name of sustainability and was recognized with a 5-leaf rating by the CST (“Turismo” 2014).

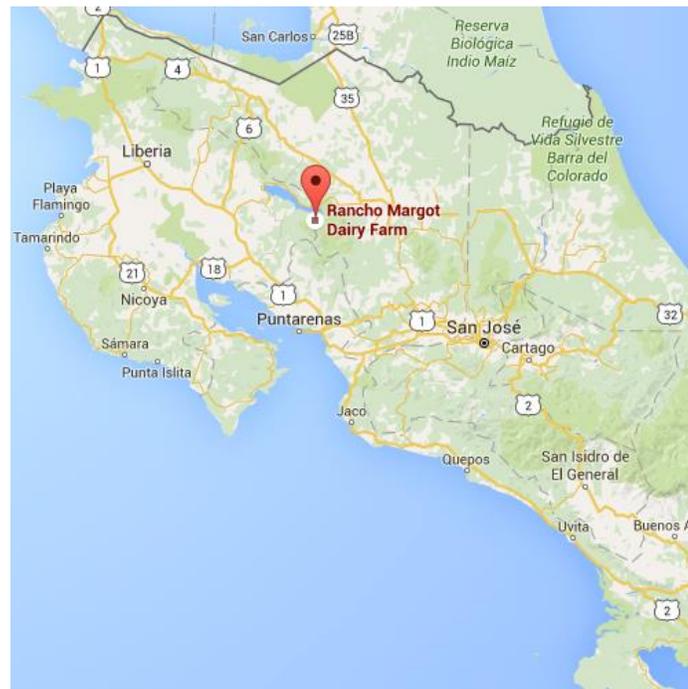


Figure 2 Location of Rancho Margot (via Google Maps)

Rancho Margot host approximately 25,000 guests per year and contracts 45 total employees. On the premises, there are three swimming pools, naturally fed by spring water that

cascades from the surrounding mountains. Irrigation for the lawn and gardens also occur naturally, without the need for any excess water usage. The facilities contain 48 restrooms, equipped with push-button faucets, however there are no extra adjustments installed in the faucets or showers to minimize water usage. Rancho Margot does implement other sustainable measures, noting that they use grey water, reclaimed wastewater, and surface water runoff for plant and crop irrigation and host educational programs about water sustainability for guests. Finally, Rancho Margot prides themselves in developing a natural filtration system that empties into the streams and rivers and the Arenal Lake Reservoir; this avoids the need to extract copious amounts of water from the nearby streams and upset the ecological equilibrium (Appendix E).

**Table 5 "Fundamentals of Hospitality and Ecotourism Operations in Natural Areas" Results for Rancho Margot**

| Yes | No | N/A | Recommended Criteria                              |
|-----|----|-----|---|
| ✓   |    |     | Treat and reuse wastewater                        |
|     | ✓  |     | Use consumption regulators in faucets             |
|     | ✓  |     | Use consumption regulators in showers             |
| ✓   |    |     | Reuse rainwater                                   |
| ✓   |    |     | Offer education on sustainable practice to guests |

| Installation Type: | Least Water Efficient Option: |  | Average Water Efficient Option: |                 |                   | Most Water Efficient Option: |   | N/A |
|--------------------|-------------------------------|--|---------------------------------|-----------------|-------------------|------------------------------|---|-----|
| Irrigation System  | Sprinkler System              |  | Drip Irrigation System          |                 | Programmed System | Ditch Irrigation System      |   | ✓   |
| Faucet             | Center Set                    |  | Single-Hole                     |                 | Motion Sensitive  | Push Button                  | ✓ |     |
| Faucet Additions   | Aerator                       |  |                                 | Flow Restrictor |                   |                              |   | ✓   |
| Shower Additions   | Aerator                       |  |                                 | Flow Restrictor |                   |                              |   | ✓   |

|        |                            |  |                     |   |                          |  |  |
|--------|----------------------------|--|---------------------|---|--------------------------|--|--|
| Toilet | Overhead Tank & Pull-Chain |  | Flushing Lever Tank | ✓ | Dual Button Flush System |  |  |
|--------|----------------------------|--|---------------------|---|--------------------------|--|--|

Table 6 "Conservation and Efficient Consumption for Water in Business" Results for Rancho Margot

### Evaluation of Survey Results

Rancho Margot has unique access to resources due to its proximity to Lake Arenal. In 1979, a local energy company decided to build a hydroelectric dam on the lake, thereby tripling its size. The company intended to create a water-energy nexus, partnering with a water company as a way to not only generate electricity, but also to use the lake to transfer water from the Caribbean side of Costa Rica to the arid Pacific region. Although a few small communities were moved during the expansion process, the lake now encourages small-scale local tourism. Rancho Margot is one of these small lodges that have created a symbiotic relationship with the energy, water, and tourism sectors, a relationship that currently works to its advantage.

The history of Rancho Margot transforming from a cattle ranch into a diverse ecological system, speaks to the lodge's positive environmental mission. Similar to Hotel Belmar, through participation in Costa Rica's CST, Rancho Margot can objectively certify its legitimacy as a true ecotourism establishment. However, to promote further sustainable alternatives, I would suggest adding faucet and shower adaptations to reduce water consumption. In addition, Rancho Margot may think about upgrading their toilets to the more eco-friendly dual-button flush system. Furthermore, although the pools at Rancho Margot are filled with local spring water, further investigation is needed in order to examine how this diversion of water for tourism has affected

the local population, as there have been cases of tourism establishments significantly hurting the availability of freshwater for local communities (Cole 2013).

A comparison of Rancho Margot's results to the other ecolodges shows that Rancho Margot actually lags in terms of implementing the most sustainable practices. This is surprising, considering its 5-leaf certification by the CST. This could mean a few different things:

- 1) Although Rancho Margot is not the top competitor among the evaluated ecolodges, they still have implemented enough sustainable water measures to place them in the upper echelon of the CST.
- 2) Rancho Margot excels in other sustainable aspects to offset where they lack in implementing water sustainability.
- 3) Receiving a 5-leaf certification may not actually be that difficult, as Costa Rica wants their establishments to get the highest honor in order to boost their own ecotourism agenda.

## Chapter 10

### Panama Case Study #1: La Loma Jungle Lodge & Chocolate Farm

La Loma Jungle Lodge & Chocolate Farm is a 56.8 acre (23 hectare) stretch of land that connects the mangrove shores of Bahia Honda, through tropical forests filled with groves of cacao (chocolate), bananas, and coconuts and reaches up to one of the highest points on Bastimentos Island. The land, only accessible by boat, borders the National Marine Park. The owners, a Peruvian archaeologist and an English museum specialist, bought the property in hopes of starting a business where they could get back in touch with nature and free themselves from urban stresses (“The Place” 2015). Since La Loma’s opening, it has received press in many travel and leisure magazines as one of the best ecotourism lodges in the area, although it lacks official certification from the CST or elsewhere.



Figure 3 Location of La Loma Jungle Lodge and Chocolate Farm (via Google Maps)

La Loma Jungle Lodge & Chocolate Farm is a small-scale operation, hosting only around 600 visitors per year and supporting 11 employees, many of who come from the local

community (Appendix F). Potable water for guest usages comes from natural springs and rainfall catchments (“The Place” 2015), as well as the nearby creek (“Feature” 2016). The facilities hold 9 restrooms in total, fixed with center set faucets. The sinks do not use any type of adjustments to regulate water usage, however the showers are equipped with flow restrictors to reduce the level of water output. Toilets are installed with standard flushing tank levers. The lodge conserves water by eliminating any swimming pool or irrigation systems on their grounds. Lastly, La Loma provides its guest with educational programs to promote water sustainability during their stay (Appendix F).

**Table 7 "Fundamentals of Hospitality and Ecotourism Operations in Natural Areas" Results for La Loma Jungle Lodge and Chocolate Farm**

| Yes | No | N/A | Recommended Criteria                              |
|-----|----|-----|---|
|     | ✓  |     | Treat and reuse wastewater                        |
|     | ✓  |     | Use consumption regulators in faucets             |
| ✓   |    |     | Use consumption regulators in showers             |
| ✓   |    |     | Reuse rainwater                                   |
| ✓   |    |     | Offer education on sustainable practice to guests |

| Installation Type: | Least Water Efficient Option: |   | Average Water Efficient Option: |                 |                   | Most Water Efficient Option: |                         | N/A |
|--------------------|-------------------------------|---|---------------------------------|-----------------|-------------------|------------------------------|-------------------------|-----|
| Irrigation System  | Sprinkler System              |   | Drip Irrigation System          |                 | Programmed System |                              | Ditch Irrigation System | ✓   |
| Faucet             | Center Set                    | ✓ | Single-Hole                     |                 | Motion Sensitive  |                              | Push Button             |     |
| Faucet Additions   | Aerator                       |   |                                 | Flow Restrictor |                   |                              |                         | ✓   |
| Shower Additions   | Aerator                       |   |                                 | Flow Restrictor |                   |                              | ✓                       |     |

|        |                            |  |                     |   |                          |  |  |
|--------|----------------------------|--|---------------------|---|--------------------------|--|--|
| Toilet | Overhead Tank & Pull-Chain |  | Flushing Lever Tank | ✓ | Dual Button Flush System |  |  |
|--------|----------------------------|--|---------------------|---|--------------------------|--|--|

Table 8 "Conservation and Efficient Consumption for Water in Business" Results for La Loma Jungle Lodge & Chocolate Farm

### Evaluation of Survey Results

When looking at the location of La Loma, one main concern is that the lodge redirects water from the local creek and springs to accommodate the needs of their guests. As mentioned before, appropriation of water for tourism purposes can be cause significant damage to local communities, as it can reduce local resources. Luckily, La Loma lies in a region that receives around 120 inches of rainfall per year (Appendix F), so water is presumably never scarce nor rainfall catchments dry. This, along with the micro-scale of the operation, minimizes the concern for inequities in regards to water appropriation. However, if La Loma were to consider expanding their operation, this factor may present a more pressing concern.

From a technical perspective, La Loma has done a fair job in implementing water-saving features, by eliminating any unnecessary irrigation and installing flow restrictors in showers to conserve water. It also offsets its spring water usage with its rainfall catchment, another very important feature. However, La Loma still has significant room for improvement. I would suggest that the lodge upgrade its faucets, as well as include additional fixtures to conserve water. La Loma's basic center-set faucets use more water than any other type available, especially with no aerators or flow restrictors installed. In addition, La Loma could consider upgrading their toilets to a more water-efficient model.

Overall, La Loma would not be considered the most water sustainable when comparing its results to the other ecolodges, and due to its lack of any certifications, its true level of

sustainability is hard to evaluate. When considering all the data given, it seems clear that La Loma falls last among all the ecolodge case studies in terms of implementing sustainable practices. It may be that due to the abundance of rainwater in this region, La Loma does not feel the need to implement as many measures to conserve water. Still, I believe that La Loma Jungle Lodge & Chocolate Farm would be well advised to implement more sustainable measures for two compelling reasons: first, for ethical reasons, as water is the single most vital resource and attention to its judicious use should be a fundamental requirement for all hotels, particularly in the ecotourism sector; and second, La Loma could benefit financially from increasing its water sustainability, as water conservation efforts are a useful marketing tool to attract the large demographic of environmentally-conscious travelers.

## Chapter 11

### Panama Case Study #2: Laguna Azul

Laguna Azul Eco-Boutique Hotel started from the dream of Argentinean Jorge Benatuel who sought to escape urban life in Buenos Aires. He bought the property in 1998 after searching for a secluded island throughout the Bocas del Toro archipelago. The site for Laguna Azul is positioned between two lagoons and the Caribbean Sea and nestled among mangrove forests on three sides. Construction on the ecolodge began in 2010, and it sits on pillars above the seawaters (Farley 2016).

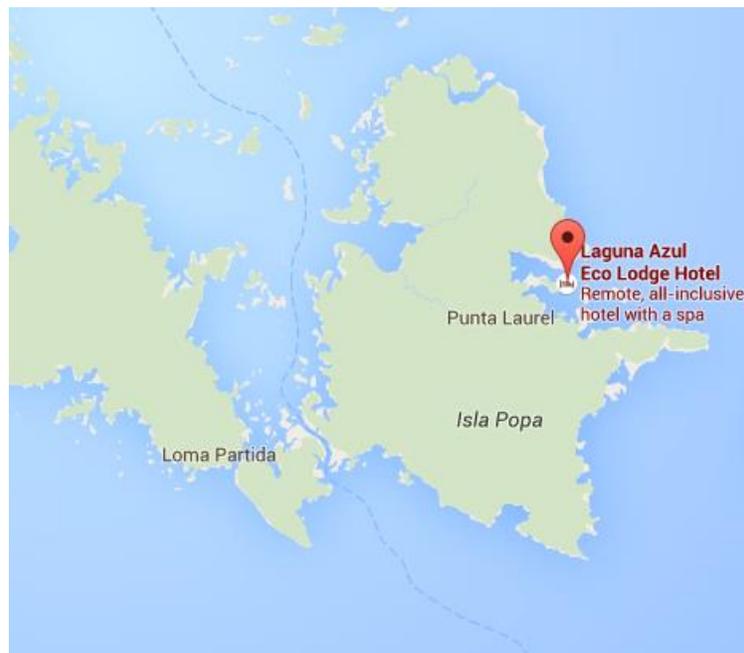


Figure 4 Location of Laguna Azul (via Google Maps)

Laguna Azul houses around 1,750 guests per year, and currently employs just five workers on the premises. Twelve restrooms are available on location for the use of staff and guests. Laguna Azul proudly boasts that 100% of guests' water needs are met by treated rainwater that is collected off the roof. As the hotel lays just above the water, there is no need for

swimming pools or irrigation systems. Center-set faucets have been mounted inside the ecolodge's restrooms, kitchen, etc., however no additional faucet adjustments have been made to reduce water consumption. Restroom toilets are equipped with a dual-button flush system, and the showers have flow restrictors installed to reduce the amount of water output. To promote sustainability, Laguna Azul offers educational programs about water sustainability for guests and has rainfall catchment to collect water. (Appendix G).

**Table 9 "Fundamentals of Hospitality and Ecotourism Operations in Natural Areas" Results for Laguna Azul**

| Yes | No | N/A | Recommended Criteria                              |
|-----|----|-----|---|
|     | ✓  |     | Treat and reuse wastewater                        |
|     | ✓  |     | Use consumption regulators in faucets             |
| ✓   |    |     | Use consumption regulators in showers             |
| ✓   |    |     | Reuse rainwater                                   |
| ✓   |    |     | Offer education on sustainable practice to guests |

**Table 10 "Conservation and Efficient Consumption of Water in Business" Results for Laguna Azul**

| Installation Type: | Least Water Efficient Option: |   | Average Water Efficient Option: |  |                   | Most Water Efficient Option: |                          | N/A |
|--------------------|-------------------------------|---|---------------------------------|--|-------------------|------------------------------|--------------------------|-----|
| Irrigation System  | Sprinkler System              |   | Drip Irrigation System          |  | Programmed System |                              | Ditch Irrigation System  | ✓   |
| Faucet             | Center Set                    | ✓ | Single-Hole                     |  | Motion Sensitive  |                              | Push Button              |     |
| Faucet Additions   | Aerator                       |   |                                 |  | Flow Restrictor   |                              |                          | ✓   |
| Shower Additions   | Aerator                       |   |                                 |  | Flow Restrictor   |                              | ✓                        |     |
| Toilet             | Overhead Tank & Pull-Chain    |   | Flushing Lever Tank             |  |                   |                              | Dual Button Flush System | ✓   |

## Evaluation of Survey Results

Laguna Azul's location in the Bocas del Toro province of Panama presents interesting complications in terms of water usage. Due to the high demand for small coastal beach hotels in Panama and Costa Rica, where most of the water comes from wells, lodges are forced to extract so much water that it causes salt to get into their well systems. Desalination is a complicated and expensive process, which causes a huge problem for these lodges. They immediately begin to lose their competitive edge from a business standpoint, because they must extract water from other locations or hope that the municipalities give them potable water. It appears as though Laguna Azul has made the necessary strides to mitigate this problem, as it has looked towards innovate methods to not only reduce water overall usage, but also completely eliminate the need for well-water. In addition, while most of Panama has potable tap water, foreign guests cannot drink directly from faucets in this region, a situation that clearly poses a challenge to Laguna Azul in filtering or transporting drinkable water for their guests.

When analyzing Laguna Azul's sustainable practices, I discovered that the ecolodge follows almost exactly the same practices as La Loma Jungle Lodge & Chocolate Farm. However, it does surpass them in one water-saving feature, as Laguna Azul has already installed dual button flush toilets. Similar to La Loma, I would suggest that the lodge upgrade its faucets, as well as include additional fixtures to conserve water.

Overall, it is difficult to tell where Laguna Azul ranks in comparison to the other ecolodges. Based on my analysis of the data given, I can conclude that it falls in the middle range in terms of implementing water sustainable practices. While it clearly places above La Loma Jungle Lodge & Chocolate Farm in terms of applying more water-friendly measures, it also

places well below Hotel Belmar. It is difficult to rank with Rancho Margot, however, because the differences in their locations mean that the measures used for one are meaningless for the other. For example, Laguna Azul does not recycle its wastewater, but due to its location above the sea and in contrast to Rancho Margot, it does not require this recycled water for vegetable irrigation. When looking at shower fixtures, Laguna Azul clearly excels in comparison to Rancho Margot, since they have installed flow restrictors. However, Rancho Margot has installed more efficient push-button faucets in their lodge, while Laguna Azul only uses the basic center set-faucets. Both of the lodges have certain trade-offs, making a direct comparison difficult. Overall, though, they both fall between the other two lodges when measuring their water sustainability practices.

## Chapter 12

### Conclusions

Both Costa Rica and Panama have made impressive progress in promoting sustainable practices in their ecotourism sector in recent decades. Costa Rica in particular has successfully created an ecotourism model that forms the basis of their tourism sector and provides the country with positive economic, social, and environmental returns. However, in order to maintain primacy as a worldwide leader for ecotourism, Costa Rica must make sure to keep its standards current. I believe that based on current trends, the country must be adaptable and react to not only climate changes, but to regional tourism demand changes as well, which may mean foregoing its reputation as the sole leader in favor of working collaboratively with other nations' tourism sectors.

For Panama, after analyzing the country's practices and policies, I am confident that with the proper practices and additional measures, they too can create an ecotourism model that closely resembles that of Costa Rica and that promises similar international prestige. I will continue my conclusions by outlining a few suggestions that I have formulated based on my research and that I believe will help Panama increase the popularity and value of its ecotourism sector.

#### **Tip #1: Invest in Ecotourism**

As I briefly mentioned earlier in this paper, Panama should consider using surplus funds from the Panama Canal to invest in the ecotourism sector. These funds could boost ecotourism by creating economic incentives for the development of new "green" facilities and activities, and

by increasing the regulation and conservation of protected lands. Such environmental protection would attract ecotourism travelers while, at the same time, maintaining the region's natural beauty and minimizing negative environmental impacts that could potentially harm Panama's ecotourism reputation.

Furthermore, the country could focus some of its investments in creating an ecotourism industry centered on domestic brands and services. Costa Rica has been able to create an ecotourism model that for every dollar earned, 60 cents remains in the country (Campos 2016). While I understand that in our globalized world, tourists will inevitably buy from recognizable, multinational brands (Starbucks, McDonald's, etc.), there are still multiple ways for Panama to both minimize the number of purchases of foreign brands and to even profit from those that do occur. For example, in Costa Rica, both taxes and domestic employment in multinational companies allow for part of the money to stay within the country (Campos 2016). In addition, and again following the Costa Rican model, Panama should invest in locally-owned hotels that offer appealing options of similar quality to foreign-owned chains. With fewer people choosing to stay in foreign hotels, such as the Four Seasons, Marriott, etc., more revenue can stay within Panama's borders providing jobs and income for future investment. By investing in ecotourism, Panama will experience the effects of increased tourism revenue, as well as its indirect effects, such as job creation, increased demand for specialized service jobs, and stronger environmental awareness and education.

### **Tip #2: Emphasize Safety**

While Panama is still known as one of the safest countries in Central America and actually has a Human Development Index higher than that of Costa Rica, it does not have as well-known of a reputation for safety as Costa Rica does among American travelers (Sood 2012). This may stem from the historical diplomatic relations between the United States and Costa Rica, in which the United States had a direct hand in pacifying the country, whereas Panama and the U.S., although currently enjoying a peaceful relationship, have had a history of political conflict. Safety perceptions will have a huge impact on Panama's expansion of ecotourism, because tourists need to have a reasonable expectation of security. We can see in the cases of El Salvador, Guatemala, and Honduras, that even with natural beauty, tourism cannot thrive if the country is perceived as too dangerous. Since the majority of Panama's visitors hail from the U.S., Panama needs to increase their efforts on being a safe place to travel.

Improving their reputation for security will also help Panamanians if they invest in more domestic brands, because travelers who are confident in their safety are more willing to take the risk in purchasing local, unrecognized products and services, instead of their familiar foreign brands. Fortunately, there seems to already exist a growing certainty for travel security in both Panama and Costa Rica, as we can see from the increasing number of flights and alternative airports being constructed in areas of high tourism. By continuing to promote an emphasis on safety, more foreign travelers will feel confident visiting Panama as a tourism destination.

### **Tip #3: Encourage Sustainability Certifications**

Unlike Costa Rica's Certificate for Sustainable Tourism, Panama lacks any national certification program to ensure legitimacy and promote Panama as a true ecotourism destination. Moreover, while more generalized Central American and global certification programs exist as well, Panama has not been very receptive to utilizing these resources (Canto 2016). While it is true that Panamanian ecotourism establishments lack formal certification, it should be emphasized that they are not necessarily less dedicated to the ecotourism mission than those who have it. As mentioned before, the small set of results from the case studies makes it difficult to confidently generalize the ecotourism credibility of entire countries. Nonetheless, Panama may still want to consider creating a national certification model similar to Costa Rica's to use both as marketing tool to reward legitimate sustainability efforts, as well as an assurance against fraudulent or exaggerated claims of environmentally responsible practices, or greenwashing.

Currently, ECOTUR-AP, Panama's interagency ecotourism development initiative, is developing standards for ecotourism that should help bolster Panama's credibility. These standards aim to respect the environment and promote sustainability through the construction and adoption of environmentally conscious and resource efficient structures (Canto 2016). While Panama already has a small number of ecotourism hotels that follow ECOTUR-AP's guidelines, I believe that a national certification system will promote even quicker development of sustainable practices and speed up the advancement of the ecotourism sector.

#### **Tip #4: Collaborate with Other Countries**

At this stage of development, I believe Panama should take a collaborative, rather than competitive, approach to advancing its ecotourism sector. By cooperating graciously with its neighbor, Costa Rica, Panama can learn the successes that have benefitted Costa Rica as a distinguished ecotourism destination. While Costa Rica's model cannot be directly copied due to its unique country characteristics, Panama can still learn from Costa Rica as a basis for creating a successful ecotourism model that is customized to the country and its unique resources.

Furthermore, I suggest that Panama consider emphasizing SITCA's multi-country approach to ecotourism travel. Because Costa Rica has a more highly regarded ecotourism industry, many foreign tourists are likely to choose this location over Panama for a single country tour. SITCA's approach, however, would allow those tourists to explore the beauty that Panama offers as well. Theoretically, this approach would lure in those travelers who may otherwise only focus on Costa Rica for eco-travel, thereby raising Panama's profile as an ecotourism destination and encouraging these tourists to visit multiple countries, or even just Panama, again in the future.

#### **Tip #5: Advertise Your Assets**

Finally, I believe that Panama needs to stress its unique offerings in order to increase their appeal for ecotourism. Tourists need to understand what sets Panama apart from other Central American countries in order to persuade tourists to travel those extra miles on a multi-country tour, or simply choose Panama as their singular ecotourism destination instead of its better-known neighbor. Unfortunately, even Panama's decision-makers for tourism know that the

country's reputation mainly centers on shopping (Canto 2016). Therefore, Panama must change this reputation by targeting advertising on tourism assets, such as their rich biodiversity. I believe that this is the main way for Panama to assume greater prominence in the ecotourism market and attract the demographic of travelers who seek unique and innovative experiences. With well-structured protected areas and sustainable travel options, Panama needs to emphasize the assets that will prove to outsiders that they can enjoy the same quality of ecotourism in Panama as they might in Costa Rica, and that Panama offers a much broader scope of tourism than the urban shopping experience in the capital.

### **Final Remarks**

The aforementioned remarks give my suggestions for ways that Panama can enhance its international prestige as a premier destination for ecotourism, thereby achieving equal footing with Costa Rica in attracting foreign revenue. However, the emphasis on ecotourism as the main focus of the tourism sector should not be pursued solely for financial gain. As my research into climate patterns and water sustainability shows, the need to be environmentally responsible has never been greater. Costa Rica and Panama have felt the dramatic effects of climate change over recent decades. These effects have become even more apparent than in most nations, due to their unique and incredibly diverse ecosystems contained within the confines of such a small geographic region. For example, with a strain on water due to droughts and overconsumption, the tourism industry in Costa Rica and Panama needs to implement sustainable measures and regulate the efficient use of natural resources throughout all sectors of tourism. Today, being environmentally conscious is far more important than any

strategy for economic gain—it is an ethical responsibility if we want to sustain our resources for future generations. Hopefully, Costa Rica and Panama, along with many other nations, will succeed in continued efforts to use their ecotourism sector as a way to educate others on environmental concerns, as well as tool to promote further protection of the world's natural beauty.

## Appendix A

### Initial Survey Letter to Participants

Original Spanish text:

Estimado/a señor/a:

Mi nombre es Ellen Rugh y soy una estudiante de la Universidad de Penn State en los Estados Unidos. Estoy escribiendo una tesis, antes de graduarme sobre la conservación y la sostenibilidad del agua en los hoteles ecoturísticos. He escogido su hotel ecoturístico para mi investigación porque pienso que Uds. son un buen ejemplo de un hotel que ha implementado algunos métodos para conservar y reciclar el agua. Me gustaría usar su hotel ecoturístico como un ejemplo práctico en mi tesis.

Por eso, estoy pidiendo su ayuda y permiso para ser parte de mi investigación. Si es posible, por favor, complete Ud. la encuesta (la encuesta la podrá encontrar en el hipervínculo adjunto). La encuesta consiste de 16 preguntas simples sobre los métodos que Uds. usan para conservar el agua. Con su ayuda, quiero encontrar los mejores métodos de conservar y reciclar el agua, ambos ecológicamente y económicamente para que otros hoteles y albergues puedan implementar las practicas y podamos salvar nuestro medio ambiente por generaciones del futuro.

El hipervínculo del encuesta: <http://goo.gl/forms/9AHF4GTF3U>

Cordialmente,

Ellen Rugh

Translated English text:

Dear Sir or Madam:

My name is Ellen Rugh and I am a student of Penn State University in the United States. I am currently writing an undergraduate thesis regarding water conservation and sustainability in ecotourism lodges. I have chosen your hotel for my research because I think that your lodge is a good example of an establishment that has implemented methods to conserve and recycle water. I would like to use your ecolodge as a practical example for my thesis.

For this purpose, I am asking for your help and permission to be part of my investigation. If it is possible, please complete the survey (which you can find in the attached link). The survey consists of 16 simple questions about the methods that your lodge uses to conserve water. With your help, I would like to find the best methods to conserve and recycle water, both ecologically and economically, in order that other hotels and hostels can implement these practices and we can save our environment for future generations.

The link to the survey: <http://goo.gl/forms/9AHF4GTF3U>

Cordially,

Ellen Rugh

## Appendix B

### Reminder Letter to Survey Participants

Original Spanish text:

Estimado/a señor/a:

Mi nombre es Ellen Rugh y soy estudiante en la Universidad Estatal de Pensilvania en los Estados Unidos. Estoy escribiendo una tesis antes de graduarme sobre la conservación y la sostenibilidad del agua en los hoteles ecoturísticos.

El mes pasado, les envié un mensaje sobre su participación en la investigación. No estoy segura que lo recibió, porque se ha observado que todavía no ha completado Ud. la encuesta.

Pienso que Uds. son un buen ejemplo de un hotel que ha implementado buenos métodos para conservar y reciclar el agua. Para mí, sería un honor tener su ayuda y permiso para formar parte de mi investigación. Por favor, complete Ud. la encuesta por viernes de la semana que viene, el 13 de noviembre.

Con su ayuda, encontraremos los mejores métodos de conservar y reciclar el agua para que podamos salvar nuestro medio ambiente por generaciones del futuro.

El hipervínculo del encuesta: <http://goo.gl/forms/9AHF4GTF3U>

Cordialmente,

Ellen Rugh

Translated English text:

Dear Sir or Madam,

My name is Ellen Rugh and I am a student of Penn State University in the United States. I am currently writing an undergraduate thesis regarding water conservation and sustainability in ecotourism lodges.

Last month, I sent a message to you regarding your participation in my research. I am not sure that you received this message, because it has been noted that you still have yet to complete the survey. I think that you are a good example of an establishment that has implemented methods to conserve and recycle water. It would be an honor for me to have your help and permission to be part of my investigation. Please, complete the survey by next Friday, November 13<sup>th</sup>.

With your help, we will find the best methods to conserve and recycle water so that we can save our environment for future generations.

The link to the survey: <http://goo.gl/forms/9AHF4GTF3U>

Cordially,

Ellen Rugh

## Appendix C

### Survey to Participants

Original Spanish text:

Encuesta sobre las medidas de conservación y sostenibilidad del agua

1. Nombre del hotel ecoturístico:

2. Número de empleados:

3. Número de servicios/baños:

4. Número de promedio de huéspedes para cada año:

5. Cuenta promedia de la factura del agua cada año, o si tiene un poso cuántos galones estima que usa anualmente:

6. Hay una piscina en su hotel ecoturístico?

Sí

No

7. Si respondió a la pregunta pasada con “sí”, ¿qué es el tamaño aproximado?

8. ¿Utiliza el sistema de riego para el césped o jardín?

Sí

No

9. Si respondió con “sí”, ¿Qué tipo del sistema de riego tiene?

Por aspersión: Trata de imitar a la lluvia por medio de tuberías y pulverizadores.

Por goteo: El agua con muy baja presión hasta las raíces y hasta distribuir el goteo. Se hace con ayuda de tubos pequeños, dispuestos en el suelo o enterrados.

Por exudación: Son tuberías de material poroso que distribuyen el agua de forma continua a través de los poros.

Programador: Utiliza un sensor que ajusta el tiempo de funcionamiento óptimo según las condiciones climáticas locales.

Por surcos: El agua circula por canales y estructuras previamente diseñadas para efectuar el riego de determinadas zonas. En este tipo de riego, las hojas de las plantas o vegetales no entran en contacto directo con el agua.

Otro:

#### 10. ¿Qué tipo de grifos hay en su hotel ecoturístico?

Grifos con ruleta: Tiene una sola entrada de agua y sola salida. Es el tipo más básico.

Grifos con monomando: Funcionan moviendo la palanca en dos sentidos: desplazándose hacia arriba se abre progresivamente el grifo y accionándola hacia abajo se cierra.

Grifos con temporizador: Se accionan pulsando un botón y dejan salir el agua durante un tiempo determinado.

Grifos con célula fotoeléctrica: Son accionados mediante un sistema electrónico activado por detectores de presencia o células fotoeléctricas.

Otro:

#### 11. ¿Usa otras adaptaciones de grifos para reducir el consumo de agua?

Aireadores: Es un dispositivo que mezcla aire con el agua de manera que las gotas de agua salen en forma de perlas.

Reductores de caudal: Los sistemas que permiten regular o reducir el caudal de agua.

Nada

Otro:

12. ¿Qué tipo de inodoros hay en su hotel ecoturístico?

Inodoros con pulsador / tirador

Inodoros con cisterna elevada

Sistema de doble descarga o de interrupción de descarga

Other:

13. ¿Hay bidé en los servicios/baños?

Sí

No

14. ¿Qué tipo de urinarios hay?

Urinario con grifo temporizado

Urinario con célula fotoeléctrica

No hay

Otro:

15. ¿Utiliza algunas adaptaciones de duchas para reducir el consumo de agua?

Aireadores: Es un dispositivo que mezcla aire con el agua de manera que las gotas de agua salen en forma de perlas.

Reductores de caudal: Las sistemas que permiten regular o reducir el caudal de agua.

Nada

Otro:

16. ¿Utiliza algunas sistemas de reutilización o reciclaje del agua?

Usamos las aguas grises, las aguas residuales regeneradas o la escorrentía de las superficies de tierra para inodoro.

Usamos las aguas grises, las aguas residuales regeneradas o la escorrentía de las superficies de tierra para riego de vegetación o cultivos alimentarios.

Tenemos las programas educativos sobre la sostenibilidad de agua para los huéspedes.

Tenemos una captación de lluvia para recoger el agua.

Nada

Otro:

Translated English Text:

Survey of Water Conservation and Sustainability Measures

1. Name of ecolodge:

2. Number of employees:

3. Number of restrooms:

4. Average number of guests per year:

5. Average cost of water bill per year, or if using a well system, the estimated gallons of water used per year:

6. Is there a swimming pool in the ecolodge?

Yes

No

7. If you answered “yes” to the previous question, what is the approximate size of the pool?

8. Do you use an irrigation system for a lawn or gardens?

Yes

No

9. If you answered “yes” to the previous question, what type of irrigation system do you use?

Sprinkler System: Attempts to imitate rain by means of sprayers and pipes.

Drip Irrigation: Water with very low pressure distributes the drip to the roots. This is done using small tubes, arranged in the ground or buried.

Soaker Hoses: Hoses made of porous material that distributes water evenly throughout its pores

Programmed: Uses a sensor to adjust to the optimal uptime according to local climate conditions

Ditch irrigation: Water flows through channels and structures previously designed for watering certain areas. In this type of irrigation, neither plant leaves nor the plant come into direct contact with water.

Other:

10. What type of faucets are in your ecolodge?

Center set faucet: The most basic type where water enters and exits through individual valves.

Single-hole faucet: Works by moving the lever two ways: pushing up gradually opens the tap and pushing down to close it.

Push-button faucet: Activates by pushing a button that releases water for a predetermined period of time.

Motion sensitive faucet: Driven by an electronic system that activates by motion detectors or photoelectric cells.

Other:

11. Do you use any other faucet adjustments to reduce water consumption?

Aerators: A device that mixes air with the water in order for large water droplets to instead come out as smaller beads.

Flow Restrictors: Systems that regulate or reduce water flow.

None

Other:

12. What type of toilets are in your ecolodge?

Toilets with flushing tank levers

Toilets with overhead tank and pull-chain

Toilets with dual button flush system

Other:

13. Are there bidets in the bathrooms?

Yes

No

14. What type of urinals are there?

Urinal with push-button flush

Urinal with motion sensor

None

Other:

15. Do you use any other shower adjustments to reduce water consumption?

Aerators: A device that mixes air with the water in order for large water droplets to instead come out as smaller beads.

Flow Restrictors: Systems that regulate or reduce water flow.

None

Other:

16. Do you have any systems to reuse or recycle water?

We use grey water, reclaimed wastewater, or surface water runoff in our toilets.

We use grey water, reclaimed wastewater, or surface water runoff for plant/crop irrigation.

We have educational programs about water sustainability for our guests.

We have a rainfall catchment to collect water.

None

Other:

## Appendix D

### Survey Results: Hotel Belmar (Translated from Spanish)

#### Survey of Water Conservation and Sustainability Measures

1. Name of ecolodge: Hotel Belmar
2. Number of employees: 52
3. Number of restrooms: 32
4. Average number of guests per year: 13,977 approx.
5. Average cost of water bill per year, or if using a well system, the estimated gallons of water used per year: 28,670 m<sup>3</sup> annually
6. Is there a swimming pool in the ecolodge?

No

7. If you answered “yes” to the previous question, what is the approximate size of the pool?

N/A

8. Do you use an irrigation system for a lawn or gardens?

Yes

9. If you answered “yes” to the previous question, what type of irrigation system do you use?

Other: The vegetable garden is the only area watered by a sprinkler system. The other gardens and green areas are not watered at any time of year.

10. What type of faucets are in your ecolodge?

Single-hole faucet: Works by moving the lever two ways: pushing up gradually opens the tap and pushing down to close it.

11. Do you use any other faucet adjustments to reduce water consumption?

Flow Restrictors: Systems that regulate or reduce water flow.

12. What type of toilets are in your ecolodge?

Toilets with dual button flush system

13. Are there bidets in the bathrooms?

No

14. What type of urinals are there?

None

15. Do you use any other shower adjustments to reduce water consumption?

Aerators: A device that mixes air with the water in order for large water droplets to instead come out as smaller beads.

Flow Restrictors: Systems that regulate or reduce water flow.

None

Other:

16. Do you have any systems to reuse or recycle water?

We have educational programs about water sustainability for our guests.

We have a rainfall catchment to collect water.

Other: We have a biodigester for sewage and a biogarden to treat grey water, which are explained to guests and students on our sustainable tours.

## Appendix E

### Survey Results: Rancho Margot (Translated from Spanish)

#### Survey of Water Conservation and Sustainability Measures

1. Name of ecolodge: Rancho Margot
2. Number of employees: 45
3. Number of restrooms: 48
4. Average number of guests per year: 25,000
5. Average cost of water bill per year, or if using a well system, the estimated gallons of water used per year: 72,317,085
6. Is there a swimming pool in the ecolodge?  
Yes
7. If you answered “yes” to the previous question, what is the approximate size of the pool?  
15 m<sup>2</sup>
8. Do you use an irrigation system for a lawn or gardens?  
No
9. If you answered “yes” to the previous question, what type of irrigation system do you use?  
N/a
10. What type of faucets are in your ecolodge?  
Push-button faucet: Activates by pushing a button that releases water for a predetermined period of time.
11. Do you use any other faucet adjustments to reduce water consumption?  
None

12. What type of toilets are in your ecolodge?

Toilets with flushing tank levers

13. Are there bidets in the bathrooms?

No

14. What type of urinals are there?

None

15. Do you use any other shower adjustments to reduce water consumption?

None

16. Do you have any systems to reuse or recycle water?

We use grey water, reclaimed wastewater, or surface water runoff for plant/crop irrigation.

We have educational programs about water sustainability for our guests.

## Appendix F

### Survey Results: La Loma Jungle Lodge & Chocolate Farm (Translated from Spanish)

#### Survey of Water Conservation and Sustainability Measures

1. Name of ecolodge: La Loma Jungle Lodge & Chocolate Farm
2. Number of employees: 11
3. Number of restrooms: 9
4. Average number of guests per year: 600
5. Average cost of water bill per year, or if using a well system, the estimated gallons of water used per year: 50,000
6. Is there a swimming pool in the ecolodge?  
No
7. If you answered “yes” to the previous question, what is the approximate size of the pool?  
N/A
8. Do you use an irrigation system for a lawn or gardens?  
No
9. If you answered “yes” to the previous question, what type of irrigation system do you use?  
N/A
10. What type of faucets are in your ecolodge?  
Center set faucet: The most basic type where water enters and exits through individual valves.
11. Do you use any other faucet adjustments to reduce water consumption?  
None

12. What type of toilets are in your ecolodge?

Toilets with flushing tank levers

13. Are there bidets in the bathrooms?

No

14. What type of urinals are there?

None

15. Do you use any other shower adjustments to reduce water consumption?

Flow Restrictors: Systems that regulate or reduce water flow.

16. Do you have any systems to reuse or recycle water?

We have educational programs about water sustainability for our guests.

We have a rainfall catchment to collect water.

Other: Water is not really a problem in Bocas, as it rains over 120 inches per year.

We have a spring that provides most of our water.

## Appendix G

### Survey Results: Laguna Azul (Translated from Spanish)

#### Survey of Water Conservation and Sustainability Measures

1. Name of ecolodge: Laguna Azul
2. Number of employees: 5
3. Number of restrooms: 12
4. Average number of guests per year: 1,750
5. Average cost of water bill per year, or if using a well system, the estimated gallons of water used per year: 120,027
6. Is there a swimming pool in the ecolodge?  
No
7. If you answered “yes” to the previous question, what is the approximate size of the pool?  
N/A
8. Do you use an irrigation system for a lawn or gardens?  
No
9. If you answered “yes” to the previous question, what type of irrigation system do you use?  
N/A
10. What type of faucets are in your ecolodge?  
Center set faucet: The most basic type where water enters and exits through individual valves.
11. Do you use any other faucet adjustments to reduce water consumption?  
None

12. What type of toilets are in your ecolodge?

Toilets with dual button flush system

13. Are there bidets in the bathrooms?

No

14. What type of urinals are there?

None

15. Do you use any other shower adjustments to reduce water consumption?

Flow Restrictors: Systems that regulate or reduce water flow.

16. Do you have any systems to reuse or recycle water?

We have educational programs about water sustainability for our guests.

We have a rainfall catchment to collect water.

## Appendix H

### Thank You Letter to Participants

Original Spanish text:

Estimado/a señor/a:

Muchas gracias por su respuesta de la encuesta sobre las medidas de la conservación y la sostenibilidad del agua en los hoteles ecoturísticos. Su participación nos ayudará en la búsqueda de los mejores métodos de conservar y reciclar el agua; así podremos salvar nuestro medio ambiente para las generaciones del futuro.

Cordialmente,

Ellen Rugh

Translated English text:

Dear Sir or Madam:

Thank you very much for your response to the survey regarding water conservation and sustainability measures in ecotourism lodges. Your participation will help us in the search to find the best methods to conserve and recycle water, so we can save our environment for future generations.

Cordially,

Ellen Rugh

### Glossary of Important Terms (Spanish to English)

**Agua gris** – nf. grey water (Non-drinkable wastewater that can be reused to flush toilets, irrigate crops, etc.)

**Agua potable** – nf. potable water (Clean water; suitable for drinking)

**Agua subterránea** – nf. ground water

**Aireador** – nm. aerator (A device that mixes air with the water in order for large water droplets to come out as smaller beads.)

**Ambiental** – adj. environmental

**Áreas protegidas** – nf. protected areas

**Biodiversidad** – nf. biodiversity

**Contaminación** – nf. pollution (of the environment); contamination; corruption (of a language, culture)

**Desarrollo sostenible** – nm. sustainable development

**Ecoturismo** – nm. ecotourism

**Energía** – nf. energy

**Eutrofización** – nf. eutrophication (The over-enrichment of an aquatic ecosystem with chemical nutrients, usually containing nitrogen or phosphorus.)

**Grifo con célula fotoeléctrica** – nm. motion sensitive faucet (Driven by an electronic system that activates by motion detectors or photoelectric cells)

**Grifo con monomado** – nm. single-hole faucet (Works by moving the lever two ways: pushing up gradually opens the tap and pushing down to close it)

**Grifo con ruleta** – nm. center set faucet (The most basic type where water enters and exits through individual valves.)

**Grifo con temporizador** – nm. push-button faucet (Activates by pushing a button that releases water for a predetermined period of time)

**Huésped** – nmf. Guest

**Instituto Costarricense De Turismo** – n. the Costa Rican Tourism Institute, also known as ICT (Costa Rica’s main organization to regulate and promote tourism, as outlined in “History of Ecotourism in Costa Rica”)

**Inodoro** – nm. toilet

**Medio ambiente** – nm. environment

**Plan Maestro De Desarrollo Turístico Sostenible-** – n. Sustainable Tourism Master Plan, also known as STMP (Panama’s plan for developing sustainable tourism in the country, as outlined in “History of Ecotourism in Panama”)

**Pozo**—nm. well

**Programador Riego** – nm. Programmed Irrigation (Uses a sensor to adjust to the optimal uptime according to local climate conditions.)

**Recursos hídricos** – nm. water resources

**Reductor de caudal** – nm. flow restrictor (System that regulates or reduces water flow)

**Riego por asperación** – n.m sprinkler system (An irrigation system which attempts to imitate rain by means of sprayers and pipes.)

**Riego por goteo** – nm. drip irrigation (Water with very low pressure distributes the drip to the roots. This is done using small tubes, arranged in the ground or buried)

**Riego por exudación** – nm. soaker hose (Hose made of porous material that distributes water evenly throughout its pores.)

**Riego por surcos** – nm. ditch irrigation (Water flows through channels and structures previously designed for watering certain areas. In this type of irrigation, neither plant leaves nor the plant come into direct contact with water.)

**Sequia** – nf. drought

**Sistema de riego** – nm. irrigation system

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Thesis Title: Ecotourism and Water Sustainability in Panama and Costa Rica: A Comparative Analysis

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#### Work Experience

Date: May 2014-August 2015

Title: Public Relations/Marketing Intern

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Institution/Company: Skyline Technology, Inc. (Malvern, PA)

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Title: ESL Teacher

Description: Created and administered a six week summer school ESL curriculum

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Awards: National Latin Exam Gold Medalist, Liberal Arts Enrichment Award for Education Abroad

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