WORCESTER POLYTECHNIC INSTITUTE

An Analysis of Environmental Certifications for Costa Rica

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Abstract

Companies use environmental certifications to demonstrate their sustainable practices to consumers, but Costa Rican companies are not taking advantage of certifications to gain competitiveness in the market. We worked with the Cámara de Industrias in San Jose, Costa Rica to determine how companies can effectively evaluate environmental certifications. Our group interviewed company representatives to determine key factors that companies take into account when considering certifications. We created comparison charts to assist companies in deciding which certification to pursue and made recommendations to encourage the implementation of certifications, including an online database, an advertising campaign, and a government incentive program.

An Analysis of Environmental Certifications for Costa Rica

Executive Summary

WORCESTER POLYTECHNIC INSTITUTE

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Problem Statement:
Environmental Certification Awareness

As awareness of environmental issues increases, people around the world are becoming more environmentally conscious. Consumers are starting to favor products and companies that use sustainable practices that avoid harming the planet (Schwepker and Cornwell, 1991). To follow this trend, companies worldwide are pursuing environmental certifications. Such certifications advertise to the public that businesses are utilizing environmentally sustainable practices, allowing participating companies to earn recognition from consumers and become more competitive in the market.

Despite Costa Rica's pride in its environmentally friendly image, Costa Rican companies are getting certified at a slower rate than companies in other countries. The sheer number of certifications leads to hesitancy for businesses in Costa Rica to become certified. Since companies need certifications to stay competitive in the evolving market, the lack of certifications is a major problem for the Costa Rican industry. The Cámara de Industrias de Costa Rica (CICR) is working to guide companies towards the appropriate certifications and reached out to us for assistance in creating recommendations to that end. Environmental certifications will allow the Costa Rican industrial sector to remain a strong presence in the market and improve the environment.

Background:

Costa Rica's growing industrial sector accounted for twenty percent of the country's GDP in 2014 (CIA, 2016). However, industries produce waste harmful to the environment. Costa Rica issued a Carbon Neutrality Note aiming to eliminate net manmade carbon emissions by 2021 (Ministry of Environment, Energy, and Telecommunications, 2009). However, the country is not currently on track to meet this goal (Costa Rica, 2015).

Many countries around the world have environmental policies that work towards environmental sustainability and are using environmental certifications to increase their marketability. Unfortunately, Costa Rica's industrial sector is falling behind on this trend, because there is uncertainty concerning which certifications will most benefit businesses.

Certifications:

A variety of international certifications that distinguish businesses for having sustainable practices are available to Costa Rica (Costa Rica, 2015). The three international certification types are Type 1, Type 2, and Type 3. A visual representation of the three different types of certifications is given below in Figure 1.

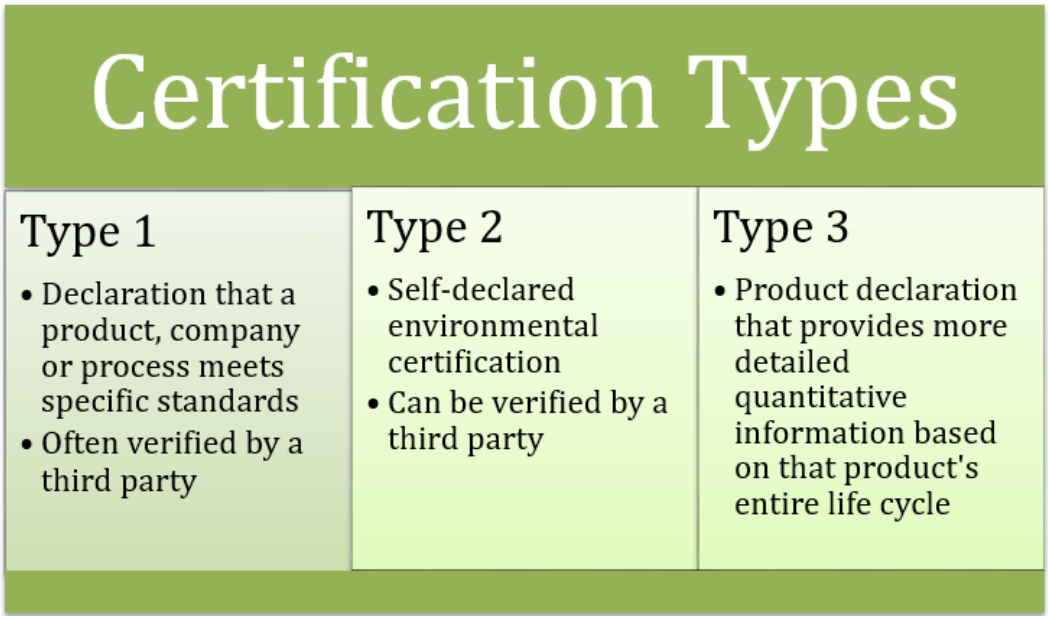

Figure 1: Types of Certifications

After receiving a certification, a company can market its products with an eco-label. Each certification requires a company to uphold a certain set of standards. All credible certifications require verification by a third-party certification body to ensure that a business has met such standards. A graphical representation of the verification process is shown to the right in Figure 2.

Environmental certifications can demonstrate a business's commitment to environmental sustainability. Certifications reward companies by granting them recognition and increased profits (International Standards Organization, 2012). With the introduction of additional certifications, Costa Rica could meet its goal by 2021 and increase its economic marketability (International Standards Organization, 2012).

Figure 2: Certification Verification Process

Methods

The goal of this project was to enable Costa Rican businesses to utilize environmental certifications effectively. To complete our goal, our team devised three objectives shown in Figure 3 below.

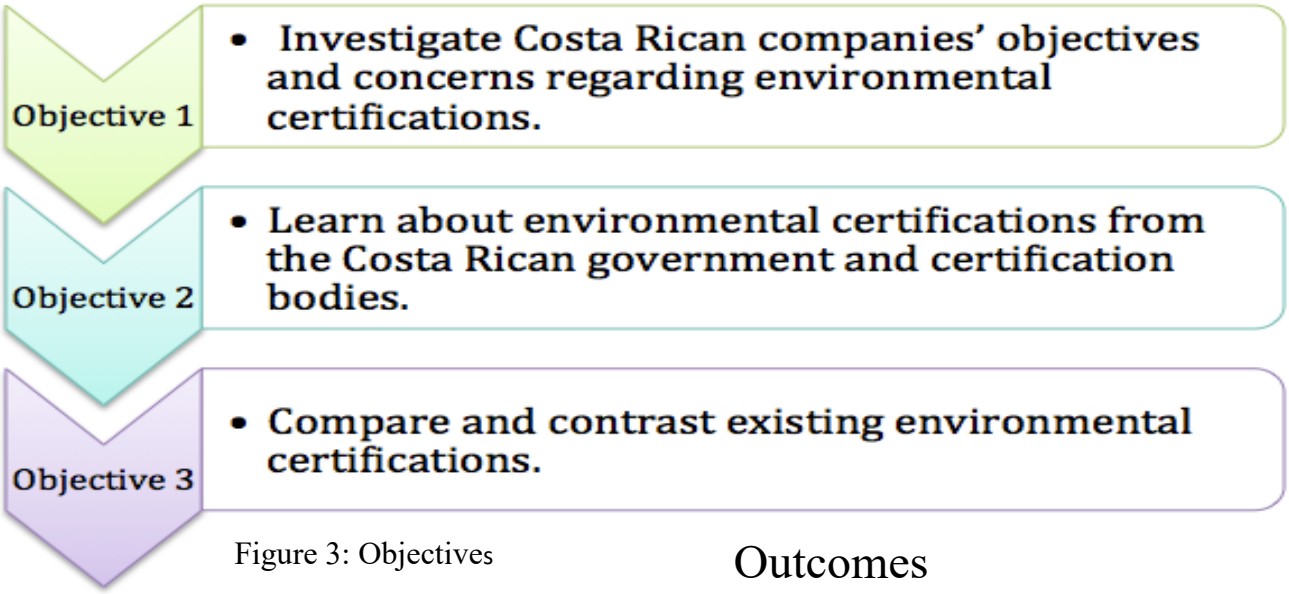

Figure 3: Objectives

For objective one we interviewed company representatives about environmental certifications. Our questions focused on factors companies consider while pursuing a certification, benefits they receive, and any reservations they have.

For objective two we interviewed five non-companies knowledgeable about environmental certifications. We asked questions about the certification process, obstacles companies faced, and the possibility of government incentives.

After concluding our interviews, we narrowed down factors companies use to make certification decisions. Using a list of Type I and Type III certifications compiled through research, we rated each certification as high, average or low for each factor. We categorized our comparison charts comparison charts to represent all the information concisely and created a decision tree to concisely represent all the categories.

Outcomes

After researching specific information about environmental certifications, we determined that detailed information is difficult to find. Although most information is available, it requires in depth research to obtain details such as cost, return on investment, availability, and specific standards. We spent significantly more time than expected finding information and, due to our short timeframe, were unable to obtain all the information we sought.

discouraged from pursuing certifications because they could not easily find the information they wanted on certifications.

We found five factors that companies consider when choosing an environmental certification: cost, return on investment, consumer recognition, credibility, and specificity. Companies investigate cost and return on investment to determine whether a specific certification will be affordable and increase profits. Consumer recognition tells the company that customers will know a certification and therefore be more likely to purchase their products. Credibility tells us whether that certification can be trusted. If a certification is credible, consumers can expect that the business that has the certification follows the standards. Specificity means the certification has well defined standards. A certification with lower specificity has lower credibility.

incentivized by the government. Multiple representatives stated they would be more likely to obtain a certification if it were incentivized by the government. Additional research discovered different types of government incentives for certifications in countries around the world, such as tax breaks and reimbursements. Our five findings are outline on the bottom of the page in Figure 5.

Using the information we found, we created four recommendations to enable Costa Rican companies to effectively implement environmental certifications.

Recommendations:

We recommend that Costa Rican companies compare certifications using our comparison charts.

Figure 4: Important factors for choosing environmental certifications in no Specific Order

These five factors are outlined below in Figure 4.

Almost everyone we interviewed identified concerns about greenwashing, whereby a company misleads consumers about its environmental impact. Companies worry that greenwashing by their competition will overshadow legitimate environmental claims and lead to consumer mistrust. However, further research determined that although greenwashing does lead to consumer mistrust, legitimate environmental claims hold up under scrutiny (Furlow, 2010).

We also discovered regional preferences in types of environmental certifications. Type 1 certifications are most prevalent in North America, and Type 3 certifications are highly used in Europe. In Latin America, environmental certifications are not very common, so there is no regional preference.

Lastly, we found that companies are more likely to obtain environmental certifications if the certifications are

We created comparison charts for different categories of certifications.

The charts enabled companies to see why certain certifications are more effective than others. For each category, we determined one effective certification. The categories we used were life cycle analysis certifications, carbon neutral certifications, carbon footprint certifications, water certifications, energy certifications, and building

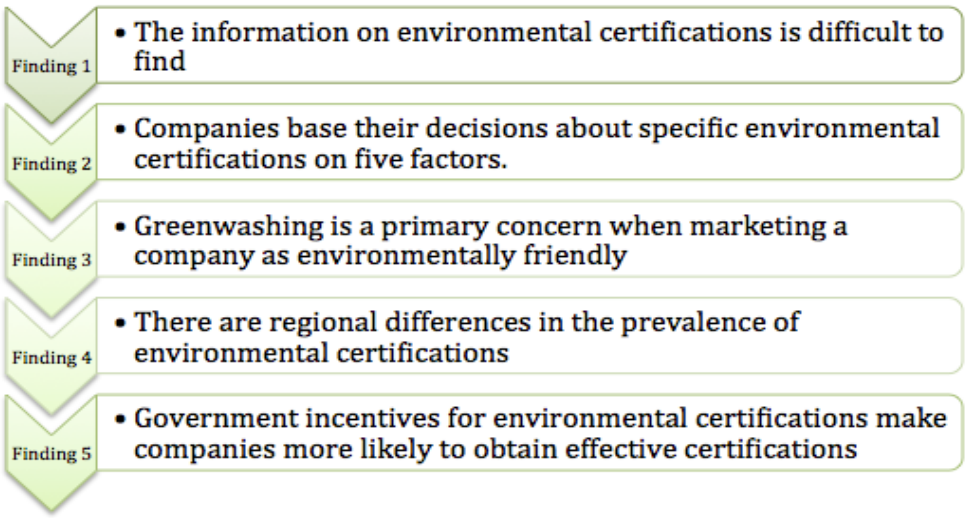

Figure 5: Findings

certifications. Our building certification comparison chart is shown to the right in Figure 6.

We recommend that CICR create a database on the CICR website of information about different environmental certifications to allow companies easy access to important information. The database should include the five factors we identified for all certifications that are available to companies in Costa Rica. We provide recommendations on how to find the information needed for the database.

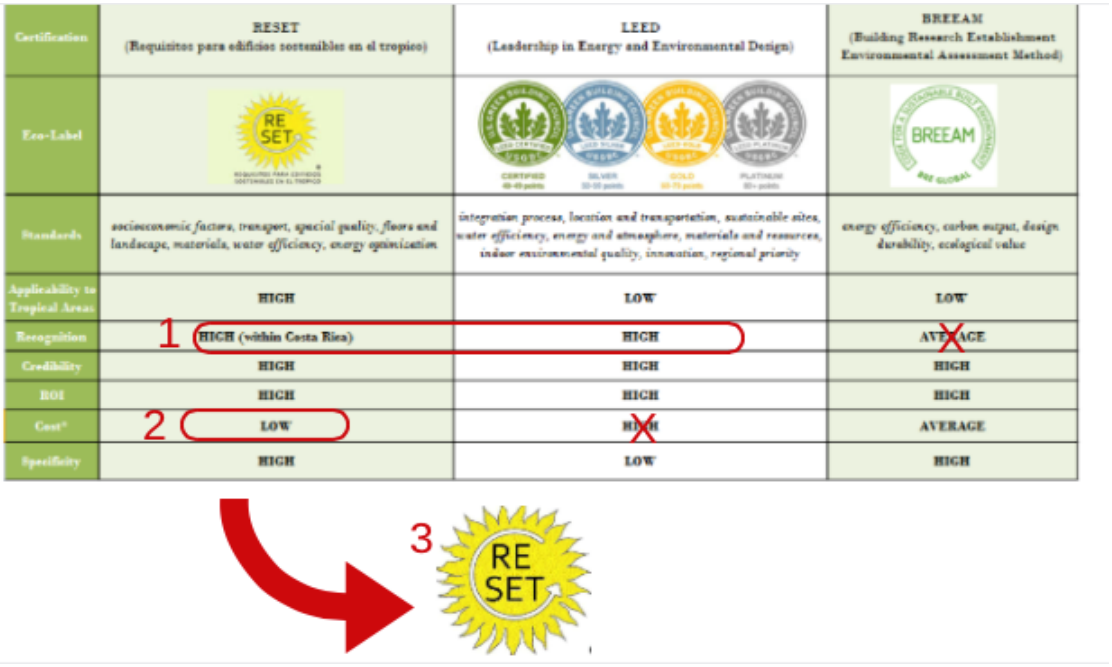

Figure 6: Comparison Chart for Building

We recommend that the Costa Rican government provide reimbursement incentives for the cost of receiving certain certifications. The government should offer reimbursements for only certain certifications to encourage Costa Rican companies to pursue the most effective certifications.

We recommend that the Costa Rican government publicize environmental certifications through a media campaign. A campaign would increase awareness of certifications and allow customers to make informed decisions when shopping. A graphical representation of our recommendations are outlined to the bottom right in Figure 7.

Conclusion

During the two months we spent in Costa Rica, our team worked with CICR to analyze available environmental certifications.
By acquiring certifications, Costa Rican companies can remain a competitive force in the international market while improving the environment. Through this process, Costa Rica will take a huge step towards forming a sustainable market, and help create an environmentally conscious society. These steps will help improve the economic future of Costa Rica and, more importantly, improve the environmental future of the world.

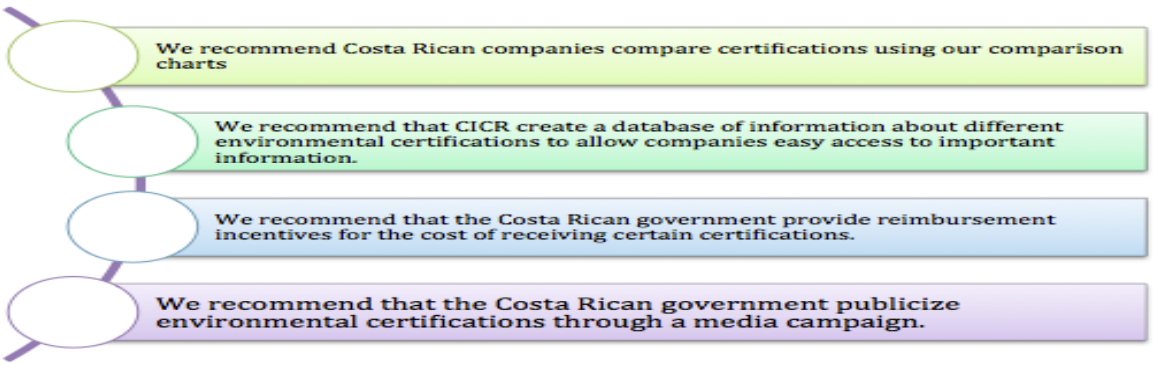

Figure 7: Recommendations

Authorship

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- Our advisors: Melissa Belz and Derren Rosbach for their invaluable advice and support throughout the project.

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Glossary

Term	Definition
CAA	Clean Air Act
CICR	Cámara de Industrias de Costa Rica
CRC	Costa Rican Colones
CWA	Clean Water Act
ECA	Ente Costarricense de Acreditacion
EPA	Environmental Protection Agency
DIGECA	Direccion de Gestion de Calidad Ambiental
FONAFIFO	The National Forestry Financing Fund
INTECO	Instituto de Normas Tecnicas de Costa Rica
ISO	International Organization of Standards
NCSS	National Climate CHange Strategy
PES	Payment for Environmental Services
PPA	Pollution Prevention Act
ROI	Return on Investment
UNEP	United Nations Environmental Programme
USAID	United States Agency for International Development

List of Tables and Figures

Chapter 1: Introduction

As awareness of environmental issues increases, people worldwide are making changes to reduce negative impacts on the environment. Consumers are becoming more conscious about the products they buy and how their purchases affect the planet (Schwepker Jr. & Cornwell, 1991). The country of Costa Rica, which relies heavily on its tourism industry and exports, prides itself on its environmentally friendly image. However, the country does not actually practice environmental consciousness to the level that it portrays (Zueras D, 2010).

Countries around the world are addressing growing environmental concerns by working towards the goal of environmental sustainability, the practice of preserving the balance between consuming and replenishing natural resources. For example, developed nations such as the United States and the European Union have created multiple environmental regulations, including the Clean Water Act and the Waste Management System (EPA, 2015). Costa Ricans are especially concerned with how pollution and climate change will affect their country's environment and biodiversity (National Biodiversity Institute, 2016). To that end, the Costa Rican government initiated the National Development Plan in 2007 to achieve carbon neutrality by 2021 (Mauri, 2009). Unfortunately, an analysis of the country's current policies and practices determined that Costa Rica is not currently on target to achieve its environmental goals (Climate Action Tracker, 2015). Although Costa Rica has been working towards environmental sustainability, the country lacks any specific regulations on industrial pollutants (Global Partnership on Waste Management: Costa Rica, 2016).

One way for Costa Rica to become more environmentally sustainable is for individual companies to improve processes to obtain environmental certifications. As awareness of environmental issues increases, consumers are becoming more conscious, preferring to buy

products that are environmentally sustainable. Certifications demonstrate to consumers that a company is practicing environmental sustainability, enabling them to be more competitive and increase their profits. Enhanced marketability incentivizes more companies to pursue environmental certifications and thus practice better environmental standards (Testa, Iraldo, Vaccari, and Ferrari, 2015).

In Costa Rica and around the world, companies can apply for a wide variety of certifications. Although businesses worldwide are taking advantage of this opportunity, Costa Rican companies are obtaining certifications at a slower rate than companies in other countries. Ironically, lack of certification partially stems from the sheer number that exist, so many Costa Rican companies are unsure how to determine which certifications are available or will provide the greatest benefits (M. Blandino and B. Johst, personal communication, February 8, 2016). Because of growing demand for environmentally certified products, businesses in Europe and the United States are adopting environmental certifications. By following this trend, Costa Rican companies can maintain their image while improving their financial standing and international competitiveness. If companies in Costa Rica do not become certified, they will begin to lose recognition in the global market.

The Costa Rican Chamber of Industries (Cámara de Industrias de Costa Rica: CICR) is working towards developing recommendations to enable Costa Rican companies to make well-informed decisions when pursuing certification opportunities. These certifications would enable the growth of Costa Rican industries by earning them recognition and improving their competitiveness in a market that increasingly demands products from environmentally sustainable companies. The Chamber of Industries reached out to our group for help with the evaluation of available certifications to strengthen Costa Rica's environmental sustainability.

The goal of our project was to enable Costa Rican companies to effectively evaluate environmental certifications. To achieve the goal, we first determined the factors that companies use to decide which certification to pursue. We then learned about the certification process from the government and certification bodies. Lastly, we compared and contrasted existing certifications using the factors we determined to be important. We synthesized our findings into interactive comparison charts and a decision tree and published them on the CICR website so that companies can use it as a guide for choosing certifications. Our findings will allow CICR to work with the public and private sectors to make recommendations and changes that will increase the use of environmental certifications, potentially enhancing the profits and international competitiveness of Costa Rican businesses while simultaneously improving the environment as a whole.

Our report begins with a literature review in Chapter 2 to provide necessary background knowledge on environmental certifications in Costa Rica and around the world. We provide an overview of Costa Rican industries and carbon goals, global environmental policies, certifications, and the effects of certifications on the market. In Chapter 3, we detail our project objectives and the procedures we used to accomplish them. In Chapter 4, we discuss our findings. We then provide an analysis of our data and draw conclusions from the information we gathered throughout our project in Chapters 5 and 6.

Chapter 2: A Review of Environmental Certifications

The dangerous effects of industrial waste are becoming more apparent as society grows to be more environmentally conscious. Chemical runoffs taint rivers, while greenhouse gases contribute to global warming and can be harmful to both plants and animals (Gray, 2008). In Costa Rica, where 4% of Earth's species are packed into just 0.03% of the planet's landmass, the impacts of such pollution are particularly alarming (National Biodiversity Institute-Costa Rica, 2016). Few regulations exist in Costa Rica on waste from industrial pollution, and the regulations and policies in place as of December, 2015 are not enough to achieve the country's goal of Carbon Neutrality (Costa Rica, 2015). This chapter provides an overview of Costa Rica's environmental goals and its current policies and certifications on water, waste, and energy efficiency. It then reviews the economic impact of environmental standards before introducing our project.

2.1 Costa Rican Industry and Carbon Goals

Costa Rica's growing industrial and manufacturing sector accounted for twenty percent of the country's GDP in 2014, However industries often produce waste and byproducts that are harmful to the environment (Cámara de Industrias de Costa Rica, 2009, CIA, 2016).

The industries in Table 2.1 produce liquid and solid waste consisting of used water from manufacturing processes and slag, leftover metallic imperfections (Li, n.d.; Alemayehu, 2004). In addition, industrial processes require combustion and the release of gaseous waste, which can contribute to global warming, ozone depletion, and smog (Waste, 2016).

Table 2.1: Breakdown of Costa Rica's Industry

Industrial Sector	Businesses in the Sector	Workers in the Sector
Food, drinks, and tobacco	27.50%	32.60%
Metallurgy	19.50%	21.30%
Paper, printing, and publishing	11.90%	7.90%
Chemical products, rubber, and plastics	8%	17.30%
Textiles, confections, and leather	7.90%	7.20%
Furniture production	7.30%	2.00%
Wood, and wood products	6.60%	3.50%
Nonmetallic mineral	4.30%	5.00%
Other industrial manufacturing	4.30%	1.40%
Basic industrial metals	1.80%	1.30%
Recycling	1.00%	0.50%
Total	100%	100%

In response to the dangers of industrial waste, Costa Rica joined the United Nations Environmental Programme (UNEP) upon the organization's foundation in 1972. As a member of UNEP, Costa Rica ratified the Basel Convention, which regulates transboundary movement of waste, and the Montreal Protocol, promising to reduce greenhouse gas emissions (UNEP Ozone Secretariat, 2015). In 1992, Costa Rica joined the United Nations Framework Convention on Climate Change, which gave birth to the Kyoto Protocol and set binding targets on emission reduction (Kyoto Protocol, 2014). In addition to these agreements, Costa Rica issued its Carbon Neutrality Note in 2007, aiming to eliminate net manmade carbon emissions by 2021 via avoiding extraneous emissions and controlling necessary ones (Mauri, 2009). In 2009, Carolina Mauri, consultant for the Costa Rican Ministry of Environment, Energy, and Telecommunications, laid out the National Climate Change Strategy (NCSS), detailing the plans to become carbon neutral. First, Costa Rica will develop and adopt a sustainable development plan based on the state of the current environment. Then, the NCCS will enhance the country's

competitiveness, enabling Costa Rica to become an international leader in the push for global climate change solutions (Mauri, 2009).

2.2 Current Global Practices

Many countries around the world already have environmental policies in place that are working towards the goal of environmental sustainability (EPA, 2016). The United States, Germany and other developed nations have some of the world's highest environmental standards (Gross Domestic Product, 2015). These countries benefit from practical law enforcement, which help reduce waste by imposing specific standards that companies have to follow. Other developing countries with similar economies, such as Brazil and Guatemala, are comparable to Costa Rica. Because of the high standards in the U.S. and Germany, and the economic similarity to Brazil and Guatemala, environmental laws in these countries are useful models to determine the feasibility of adopting similar laws in Costa Rica.

2.2.1 Laws in Developed Countries

The United States has important environmental laws regarding waste, air, and water treatment. The Environmental Protection Agency (EPA) administers programs to ensure the proper handling, treatment, and disposal of waste. Such programs inspect and review business records in order to monitor law adherence (EPA, 2016). In cases where laws are not properly followed, the EPA takes civil or criminal enforcement (EPA, 2016). The major federal environmental laws that control pollution in the US include the Clean Air Act (CAA), the Clean Water Act (CWA), and the Pollution Prevention Act (PPA). Under CAA, plans for limiting air pollution are approved by the EPA, and if measures are not followed, the agency can authorize

sanctions against the state (EPA, 2016). The changes in air quality from 1986 to 1995 show great improvement, as shown in Table 2.2.

Table 2.2: Air Quality and Emission Trends in the U.S. (EPA, 2016)

Table 1. Air Quality and Emissions Trends 1986–95.

	Air quality change (%)	*Emissions change (%)*
Carbon monoxide	–37	–16
Lead	–78	–32
Nitrogen dioxide	–14	–3 (nitrogen oxides)
Ozone	–6	–9 (VOCs)
PM-10*	–22	–17
Sulfur dioxide	–37	–18

*PM-10 changes are based on 1988–95 data

The CWA regulates pollutant discharge and sets water quality standards. This law has prevented billions of pounds of river pollution since enactment by making it unlawful to discharge pollutants without a permit (American Rivers, 2014). Similar to the CWA, the PPA also uses sustainable practices to increase energy efficiency and reduce pollution. This act implemented a source reduction program, to eliminate waste before it is created by setting threshold limits on the amount of pollution that a facility can create. These laws, enacted in 1970, improved many aspects of the environment, and reduced pollutants generated by large factories and power plants (J. Clarence Davies, Jan Mazurek, 1997).

Similar to the United States, Germany is a leader in promoting environmental sustainability and is committed to 100% renewable electricity by 2050 (Globe International, 2015). The country implemented an effective waste management system, Municipal Solid Waste Management, which ensures waste removal on a greater scale. As a result, Germany recycled more than 60% of solid waste with only about 1% going to landfills in 2007 (National Renewable Energy Laboratory, 1995; Programa CYMA, 2007). Germany's waste management program can be seen as a successful strategy to help combat pollution to the environment.

2.2.2 Laws in Developing Countries

Developing countries such as Guatemala and Brazil are starting to implement environmental regulations but have problems unique to developing countries to consider. Past research on Brazil suggests a lack of funds for establishing environmental protection agencies as well as incentives to pursue positive economic changes (Managing Costa Rica's Waste, 2010). Brazil enacted Law Number 9,433 in 1997, which establishes that the management of water supply, sewage, and solid waste must be consistent with public health codes and requires the state and local governments to meet these requirements (Antonio De Aguiar Patriota, 2009).

Guatemala, like Brazil, also has similar biodiversity and economy to Costa Rica. Guatemala faces similar environmental issues to Costa Rica such as climate change and environmental contamination. The United States Agency for International Development (USAID) helps to address these environmental issues in Guatemala. Specifically, USAID works to improve land conservation, carbon emissions, and climate change. USAID has a Low Emission Development Strategy that allows it to administer strategies and policies towards limiting emissions (Environment of Guatemala, 2015). USAID's efforts resulted in a signed bilateral agreement with the U.S ambassador and the Vice President of Guatemala in 2013 that created a Low Emission Development Plan. Guatemala's economy was improved by USAID's strategy that enhanced emission regulations (Environment of Guatemala, 2015).

2.2.3 Current Costa Rican Laws

Costa Rica prides itself on its environmental sustainability and is dedicated to preservation by enacting environmental laws (Costa Rica Const. art. 50). The Costa Rican law, Ley 8839 details Costa Rican national guidelines for waste management. It describes policies for

waste movement, import, and export at different levels. Documented in 2012, the law is a step that Costa Rica is taking towards sustainability (Costa Rica Publishes Proposed Integrated waste Management Regulations, 2012).

Forestry law no. 7575 created The National Forestry Financing Fund (FONAFIFO) for the purpose of paying for Costa Rica's forestry projects and aiding in the country's goal of reducing carbon levels. The fund manages the country's resources to assist in protecting the forests of Costa Rica (Fondo Nacional de Financiamiento Forestal, 2014).

The National Forestry Financing Fund has paid for projects that aim to protect and conserve Costa Rica's environment. For example, Reducing Emissions from Deforestation and Forest Degradation helps create policies and programs to halt forest reduction, and the Pax Natura Project protects and conserves the environment (Fondo Nacional de Financiamiento Forestal, 2014). The latter has reduced Costa Rica's carbon emissions by 500,000 metric tons (Garcia, 2012). Another project that arose from FONAFIFO is the Sustainable Biodiversity Fund, which provides a steady supply of money towards the conservation of lands with high biodiversity. As well as aiding in the development of smaller projects, FONAFIFO is also responsible for the creation of some of Costa Rica's large-scale countrywide programs (Fondo Nacional de Financiamiento Forestal, 2014).

Through FONAFIFO, the Costa Rican government created the Payment for Environmental Services (PES) program in 1987 in an effort to restore its lands to their natural state. PES charges businesses for their use of environmental resources then uses these funds to aid landowners in land restoration (Pagiola, 2008). The program also gives these landowners financial recognition from the State for services that help protect and improve the environment (Fondo Nacional de Financiamiento Forestal, 2014). Examples of such services are the

mitigation of greenhouse gas emissions, the upkeep of water quality, the protection of biodiversity and ecosystems, and the preservation of beautiful lands for the benefit of science or tourism.

The National Forestry Financing Fund has directly affected the Costa Rica Climate Change Strategy and helped the country reverse deforestation. Due to FONAFIFO, the country had 53.4% forest coverage in 2010, a huge improvement over the 21% coverage from the 1980s (National Forestry Financing Fund (FONAFIFO), 2016). The Forestry Fund and its various environmental projects show Costa Rica's dedication and efforts towards achieving their goal of carbon neutrality. With the introduction of additional certifications to the Costa Rican industry, Costa Rica could meet this goal by 2021 as well as increase its global economic marketability (International Standards Organization, 2012).

2.3: Environmental Certifications

Environmental certifications are a set of specific standards that a company can voluntarily follow and use to market itself. Certifications can demonstrate a business's commitment to environmental sustainability. Businesses have the option of pursuing environmental certifications for their company, products, and buildings. Such certifications demonstrate that an enterprise holds itself to higher standards than the law requires. Businesses apply for specific certifications,which are granted if they uphold the certification's standards (Bender, 2012). The certifications reward companies by granting them recognition, resulting in increased profits (International Standards Organization, 2012).

2.3.1: Environmental Certifications

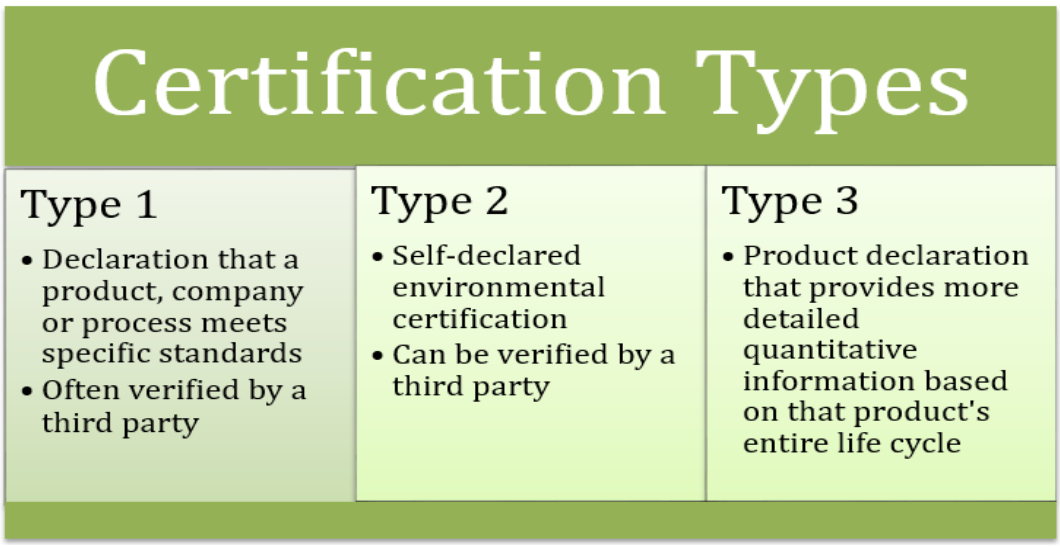
A variety of international certifications are available to Costa Rican companies that reward businesses for having environmentally sustainable processes (Costa Rica, 2015). Each certification requires a company to meet a certain number of standards. Such certifications allow firms to demonstrate their sustainability and market their business as environmentally friendly by using eco-labels.

There are three types of organizations that can verify a certification: first party, second party, and third party. First party certification occurs when a person or organization claims their own product meets a specific certification's criteria. Second party certification is when the organization that owns the certification declares that products meet certain criteria. The most credible, third party certification transpires when an independent organization reviews the process of a product and determines its compliance with the specific certification's requirements (Hammar, 2015). An independent organization can add to its reliability by becoming accredited. To do so, another unbiased company must audit the organization's practices and determine those practices to be impartial, competent and consistent (International Accreditation Forum, 2011).

There are three main types of environmental certifications that use eco-labels, as defined by the International Organization for Standards, Type 1, Type 2, and Type 3 (Global Ecolabelling Network, 2016). Type 1 certifications have specific standards created by a company separate from the one receiving the certification. Type 2 certifications are self-declared, which means a company claims that its own products or processes are environmentally sustainable (Global Ecolabelling Network, 2016). Since Type 2 certifications often do not use predetermined criteria for their standards, they are not as credible as the other two types (Ecospecifier Global, 2016). Type 3 certifications are life cycle analyses and provide detailed quantitative information

of specific products. A first, second, or third party organization can verify a Type 3 certification, depending on the specific certification (Global Ecolabelling Network, 2016). The different certification types are outlined below in Table 2.3.

Table 2.3: Types of Certifications



After receiving a Type 1, Type 2, or Type 3 certification, a company can market its certified products by placing an eco-label on the product or advertisements. Eco-labels indicate to the consumer that the product is environmentally friendly and allow for increased competitivity (EcoSpecifier Global, 2016).

2.3.2: Certification Process

Costa Rica encourages businesses to pledge themselves as eco-friendly by adopting international and national certifications (Dhia Ben-Haddej, 2010). Such certifications allow enterprises to prove that their products and services are upholding specific environmental

standards. Certifications can be placed on products to advertise their environmentally sustainable practices.

For credible third party certifications, a business must first make sure it meets the certification's standards. The business contacts the company that publishes the certification to get a price quote and learn the certification's standards, the requirements necessary to receive the certification. After the publishing company informs the business of the certification's standards, it assists the business in determining how to meet them. Once a business completes a self-assessment, it contacts a third party certification body. The certification body will administer an initial audit that creates a full data report based on the desired standard and validates the report's accuracy. If the business does not meet the certification's standards, it must then construct goals and a plan of action in order to fulfill the requirements. Once the certification body verifies the requirements, the business is awarded a certification within a year (Bender, 2012; D. Cordero, personal communication, 20 April 2016). Benefits of certifications include improving the company's reputation and providing a competitive and financial advantage by reducing operating costs related to energy consumption (International Standards Organization, 2012). While most certifications do not offer an instant return on the initial cost, the right certifications will provide financial benefits as a long-term investment (Bellesi, Lehrer, and Tal, 2005). Figure 2.1 shows a graphical representation of the verification process.

Figure 2.1: Third Party Certification and Verification Process

2.3.3: Voluntary Use of Certifications

Although environmental certifications provide incentives for companies to become more environmentally friendly, obtaining certifications is not required by the country. Since they are voluntary, not all businesses take the necessary steps to be more environmentally friendly. Therefore, the existence of certifications is not always effective at reducing the environmental impact of a company unless the company chooses to pursue the certification (Blackman and Naranjo, 2012).

With the current government policies and their rate of implementation in Costa Rica, the country will not be able to reach its goals of Carbon Neutrality and sustainability (Costa Rica, 2015). In late 2015, Climate Action Tracker analyzed Costa Rica's environmental protocols and

carbon emissions and determined that the country will not be able to achieve its goal, shown in Figure 2.2

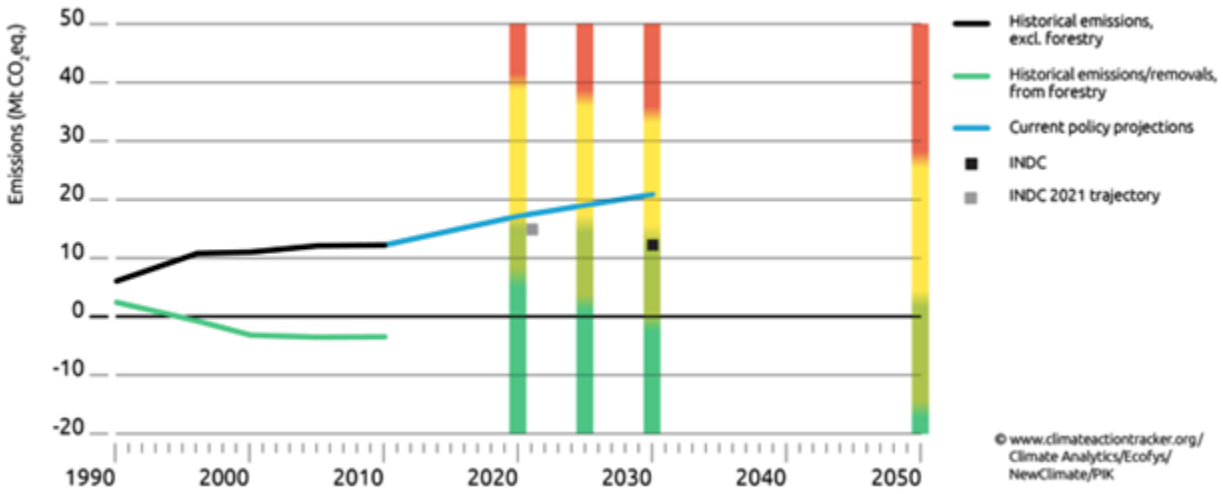


Figure 2.2: Projected Carbon Dioxide Emissions (Costa Rica, 2015).

Figure 2.2 shows Costa Rica's projected carbon dioxide emissions with its current policies and certifications (Costa Rica, 2015). The blue line shows the projections for carbon emission with current policies. This line shows that Costa Rica's current policies will not enable it to be carbon neutral by 2021, which would require the blue line to pass through the grey box. Since Costa Rica is not on track to meet their goal of carbon neutrality, more Costa Rican companies need to begin pursuing environmental certifications. Even though certifications are voluntary, companies should consider the benefits of having a more sustainable business model.

2.4 The Green Business Model

Most companies will not want to spend money to meet environmental standards if there is no monetary benefit, as increased restrictions and regulations can be expensive. This section outlines the costs and benefits that affect companies that apply stricter environmental standards

and looks at Patagonia: a company that began to tighten its guidelines in 1985 and Whole Foods: a US company that relies upon eco-labels.

2.4.1 Cost and Benefits of Going Green

Despite the importance of a healthy environment, many companies do not want to risk their bottom lines, and environmental standards can negatively impact an economy. In 1993, a study published by the U.S. National Bureau of Economic Research found that the costs of meeting increased environmental regulations adversely affect productivity at the firm level (Gray and Shadbegian, 1993). The study found that for every dollar used to comply with environmental standards, a firm loses an average of three to four dollars of productivity (Gray and Shadbegian, 1993). However, the same study also recognized that this negative correlation only occurred when productivity was measured against abatement costs, meaning the extra cost of implementing methods to meet these standards decreases the net income of the firm. However, when productivity was measured against level of enforcement or level of compliance, the results were inconclusive (Gray and Shadbegian, 1993). This result makes sense because meeting the standard introduces a new fixed cost, which means the company would have to sell more goods to compensate the cost. Furthermore the authors used data collected between 1975 and 1985, a full eight to eighteen years before the beginning of the study (Gray and Shadbegian, 1993). The use of old data and inconclusive results begs the question of whether it is now possible to profit using an environmentally friendly management strategy.

Two studies from 2005 and 2007 answer this question in the affirmative. In 2005 Rao and Holt used the green supply chain management tool in Southeast Asia as an example of an efficient green strategy. The approach attempts to reduce unsustainable practices in logistics and production of goods, and the study concludes that the strategy improves competitiveness and

economic performance (Rao and Holt, 2005). In 2007, Cohen and Winn identified imperfections in the classical economic theory that a savvy entrepreneur could exploit. By capitalizing on inefficiencies such as negative externalities, costs to a third party like the environment that are not reflected in the price of a product, the entrepreneur can both turn a profit and improve the surrounding environment (Cohen and Winn, 2007). For example, Hackett Electronics in California reclaims and sells old computers or computer parts. In doing so it exploits the negative externality, in this case the negative environmental impact of computer waste, which reduces waste and increases revenues while keeping the cost of goods relatively low (Cohen and Winn, 2007). These more recent studies prove that environmental regulations are not only feasible, but a tool for profitable management.

Beyond government imposed regulations, a company can hold itself to self-imposed standards through the use of certifications. Some studies identify weaknesses in eco-labeling, such as arbitrary criteria, lack of real rewards, and brevity of relevance (Galarraga Gallastegui, 2002). However, a more recent study found that products with eco-labels diminish brand loyalty of products without eco-labels and actually increase their own brand recognition (Testa, Iraldo, Vaccari, and Ferrari, 2015). Labeling schemes also make choices easier for shoppers by placing a recognizable label on products, so if the consumer is familiar with the eco-label, he automatically knows that the product is eco-friendly (Galarraga Gallastegui, 2002). However, consumers also have to beware of misleading marketing when it comes green marketing.

Companies can trick consumers using a practice called greenwashing, marketing used to mislead consumers about how environmentally friendly a company's policies or products are. For example, greenwashing can be accomplished by marketing a company's environmentally conscious practices while ignoring the same company's pollution. The oil and gas company BP

utilized greenwashing starting in the 1990s. In 2000, BP began the "Beyond Petroleum" campaign, which marketed BP's small investment in renewable energy while ignoring the company's huge spending on oil extraction, which is very harmful to the environment (Landman A, 2010). Even though BP was ranked in the top ten worst companies by *Multinational Monitor* in 2005, 49% of survey respondents believed that BP had become more environmentally friendly (Furlow, 2010). When companies such as BP that greenwash come under public scrutiny for misleading marketing, they reduce consumer trust in environmental claims made by companies as a whole. Consumer mistrust could extend to companies whose environmental claims are accurate and substantiated (Furlow, 2010). However, companies that use strong certifications with credible standards will stand up to examination and retain customer faith (Honey, M, 2002). Therefore, while upholding strict environmental standards, businesses can use certifications to increase profits and show consumers that their products were produced in an environmentally friendly manner.

Coopedota, a Costa Rican coffee company, provides an example of the benefits and drawbacks to environmental certifications. The company has acquired multiple environmental certifications, including Rain Forest Alliance, Fair Trade, Cafe Practice, and Carbono Neutro (Jimenez, Kilian, and Rivera, 2013). Coopedota's environmental certifications allow the company to make a higher profit when selling its certified coffee, as detailed in Table 2.4.

Table 2.4: Projected Coopedota Sales of Certified Coffee (Jimenez, Kilian, and Rivera, 2013)

PROJECTED SALES (2011-2012)

CERTIFICATION	QUINTALS SOLD	% TOTAL RECEIPT	PRICE DIFFERENTIAL
CARBONO NEUTRO	555.00	1.02%	+5
CAFE PRACTICE	14,437.50	26.62%	
RAIN FOREST	6,975.65	12.86%	+10
FAIR TRADE	225.00	0.41%	+12

* In 2011-2012 54,243.76 bushels harvested

Source: Compiled by the authors using data from Coopedota 2012.

The above table shows the number of quintals, a measurement of coffee, sold under each environmental certification from 2011 to 2012 and the price differential between certified coffee and uncertified coffee. There was a positive price differential, the premium the certification earns, of at least +5 United States Dollars per 100 kg of coffee for all but one certification. The table shows the increase in profit that can be acquired by marketing environmental certifications. However, this benefit needs to be compared to the cost of achieving the certification. In 2011, Coopedota budgeted US $29,000 solely for the acquisition of its carbon neutral certifications (Jimenez, Kilian, and Rivera, 2013). More money must be used to keep a certification; certifications must be reviewed every so often to determine whether the company is keeping up the certification's criteria. In 2012, Coopedota spent US $12,492 to keep its carbon neutral certification (Jimenez, Kilian, and Rivera, 2013). Companies, including those in Costa Rica, can choose effective certifications by looking at those whose benefits outweigh the costs of obtaining the certifications. However, the outdoor clothing company, Patagonia, became environmentally conscious without opting to use certifications.

2.4.2 A Case Study: Patagonia

Patagonia is an American outdoor clothing and gear company that markets its eco-friendly businesses practices. Since 1985, Patagonia pledged 1% of its sales to preserve the natural environment (Patagonia, 2016). Patagonia has an effective business model because the company is committed to reducing its environmental impact and therefore efficiently uses its resources. The company's first strategy included the switch to organic cotton instead of pesticide intensive cotton in 1996 (Patagonia, 2016). By focusing on quality over quantity, Patagonia is able to raise its prices to offset a potential decrease in quantity sold (Daniels Fund Ethics Initiative, 2012). Although focusing on more durable products can be a risky business decision, consumers reported they were more willing to buy from Patagonia due to the company's environmental awareness and high quality products (Daniels Fund Ethics Initiative, 2012).

In 2005, Patagonia launched its Common Threads Garment Recycling program through a partnership with Ebay, a company where consumers can buy and sell goods online. This program encouraged customers to recycle their old garments into new clothing and consequently has recycled 34 tons of clothes as of 2012, saving vast amounts of processing pollution and energy consumption in the process (Daniels Fund Ethics Initiative, 2012). Also, Patagonia is currently working with Bluesign Technologies, an organization that aids in the removal of toxic substances from manufacturing processes to decrease resource consumption. As of 2015, 56% of Patagonia's material was Bluesign approved (Drake Baer, 2014). With Patagonia's involvement, the negative impacts on the environment have decreased.

With the help of these partnerships and environmental campaign aids, Patagonia has increased its sales at an annual average growth rate of 6.9% since 1993, for a total of $600 million in revenues in 2013 (Stahlinksi, J, et al., 2016; Drake Baer, 2014). Patagonia also

reported a gross margin of 52.6% in 2016 and experienced a 9.6% return on equity after the company pledged to donate 1% of its sales (Stahlinksi, J, et al., 2016). By keeping the company private and focusing on core business values rather than bottom line profits, Patagonia exemplifies a successful company with the ambition to make a positive difference in the environment. Costa Rican companies can follow in Patagonia's steps to become more environmentally sustainable while earning public recognition.

2.4.3: A Case Study: Whole Foods Market Inc.

Companies can also choose to follow Whole Foods' strategy by marketing their environmental eco-labels. Whole Foods Market Inc. is an American chain of supermarkets that has specialized in selling organic food for over 30 years (Whole Foods Market, 2012). In 2003, Whole Foods became the first certified organic grocer going above and beyond USDA standards (Whole Foods Market, 2008). For example, the company does not allow their products to contain food additives such as artificial preservatives, colors, sweeteners, and flavors that can be found in conventionally-produced food products. On March 29, 2007, Whole Foods launched The Whole Trade Guarantee label for their products to inspect products from foreign countries (Whole Foods Market, 2008). This program guarantees four qualities for each product including meeting high-quality standards, providing more money to producers, ensuring better wages and working conditions for workers, and utilizing environmental business practices. The company wants to ensure customers that the products they are purchasing have ethical and organic origins. Whole Trade items include tea, coffee, fresh fruit, coffee, and cleaning products that are sold at Whole Foods stores. The company produced this program through third party certifiers such as Fair Trade USA (Whole Foods Market, 2012). However, the Whole Trade label has not necessarily been an economic boon for Whole Foods. The cost of goods sold rose at the same

rate as increases in sales, leaving the gross profit margin to hover between 34% and 36% since 2003 (Whole Foods Market, 2015; 2013; 2011; and 2008). This information does not imply that the label is ineffective, it simply means that the increase in the products' sale price was met with a corresponding increase in cost of production. In fact, there is evidence that demand for products bearing the Whole Trade label has risen since its introduction in 2007. Between 2009 and 2010, Whole Foods added the label to under one hundred items while increasing sales of Whole Trade labelled products by almost $40 million, and overall sales increased by almost $1 billion in the same year (Whole Foods Market, 2010 and 2009). Though Whole Foods does not profit directly from selling Whole Trade products, the company benefits from increased demand for its goods while helping the environment and producers. Whole Foods' example shows that companies in Costa Rica can increase their competitiveness through the use of environmental certifications and labels.

2.5: Our Project

Costa Rican companies could benefit from following Patagonia and Whole Foods' examples of environmentally sustainable marketing. One way for companies to do so is to incorporate Whole Foods's strategy and adopt environmental certifications. The Costa Rican Chamber of Industries (CICR), an organization that aims to improve the country's industrial sector, is working to analyze environmental certifications. CICR hopes to use this analysis to make recommendations to the industrial sector on which certifications to pursue. The implementation of environmental certifications will help to slow the assault of climate change, protect Costa Rica's incredible biodiversity, and reduce Costa Rica's waste (M. Blandino and B. Johst, personal communication, February 8, 2016). We will assist CICR by conducting analyses

on environmental certifications available to Costa Rican companies and working with Costa Rican industries to develop comparison charts and a decision tree to enable companies to make choices on certifications. Certifications will support Costa Rica's aims of environmental sustainability and enable the country to reach its goal of Carbon Neutrality.

2.6 Chapter Summary

Companies around the world are becoming certified and using environmental certifications to increase the marketability of their products. Unfortunately, Costa Rica's industrial sector is falling behind on this trend, as there is uncertainty concerning which certifications will be most beneficial to businesses. Costa Rica can expedite its progress towards environmental sustainability if companies choose to pursue environmental certifications. Costa Rican businesses would not only see higher profitability in the global market, which is growing to favor environmentally conscious products, but would also aid the progression of Costa Rica's goal of achieving carbon neutrality in 2021. The following chapter details the methods we will use to accomplish our goal.

Chapter 3: Methodology

The goal of this project was to enable Costa Rican companies to evaluate environmental certifications effectively. To complete this goal we implemented a multi-faceted process involving the three objectives also outlined in Figure 3.1.

1. Investigate Costa Rican companies' objectives and concerns with environmental certifications.
2. Learn about environmental certifications from the Costa Rican government and certification bodies.
3. Compare and contrast existing environmental certifications to determine which would be most effective for Costa Rican companies.

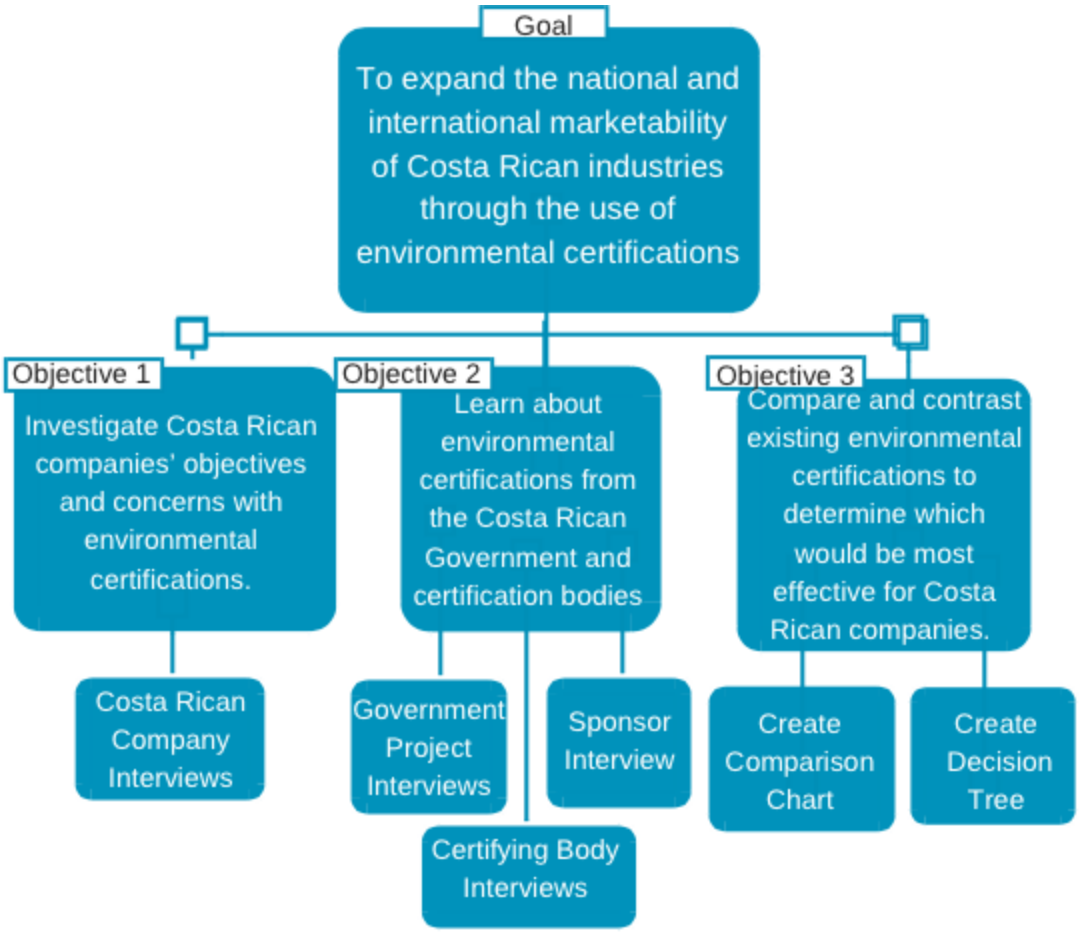


Figure 3.1 Methods and Objectives

In this chapter we discuss in detail the methods we used to accomplish each objective and then discuss the limitations of our methods.

3.1 Objective 1: Investigate Costa Rican companies' objectives and concerns with environmental certifications.

Our first objective aimed to understand companies' opinions and concerns with certifications, and how companies can successfully implement certifications into their business.

To determine what companies value in eco-labels and certifications and the benefits they hope to receive, we interviewed representatives from Costa Rican companies involved with CICR.

3.1.1 Costa Rican Industrial Company Interviews

To complete this objective, we interviewed representatives from companies that were either already certified or were interested in certifications. This allowed us to gain insight into how companies viewed certifications and better understand how to create recommendations for industrial companies in Costa Rica. To have a larger scope of data, we picked companies from a variety of sizes and target markets. The businesses representatives we interviewed included; Andres Villalobos Herrera (Environmental Manager at Holcim - a cement company), Isabel Moya (founder of Ecoclean - a cleaning products company), Guillermo Blanco (General Manager of Sykes - a customer contact solutions company), Silvia Chaves (Vice President of Florex - a cleaning products company), and David Cespedes (Manager of Rectificación Alajuelense - a metalworking company). Of the companies we chose, Sykes and Florex were Type 1 certified, Ecoclean and Holcim had their own Type 2 certifications, and Rectificación Alajuelense was uncertified but interested in certifications. Our sponsors gave us the contact information for each of these companies. We used semi-structured interviews because they allowed for open ended questions, gave our team the opportunity to come up with new topics not previously contemplated, and gave our interviewees a chance to provide us with detailed responses (Berg & Lune, 2014).

In the interviews, we asked their reasoning for having or not having certifications, and if they are pursuing any others. Our questions focused on what they might hope to get out of a certification, what they look for in certifications, and any hesitations or concerns they have. For our interviews, we collected our data by note-taking while simultaneously recording the interview audio on a digital device. Our group sent emails with follow up questions to these companies for the information we did not realize was important until after the interview. To qualitatively analyze our data, we coded any reoccurring information into themes. If a piece of information fit into multiple categories, we put it into both, noting the other categories in which we placed it.

3.2 Objective 2: Learn about environmental certifications from Costa Rican government and certification bodies.

For our second objective, we investigated data and opinions about certifications from organizations experienced with environmental certifications. After learning from CICR about a Costa Rican government project on environmental certifications, whose goal was to create an official certification to be used by the Costa Rican industries, we gathered information from members of this project to help us gain information on environmental certifications. We also interviewed certification bodies because they have first-hand knowledge of the certification process.

3.2.1 Interviews with Members of the Government Project

We interviewed representatives from companies who were members of the government project to obtain a different perspective on environmental certifications because they were not active participants in the market. Project members could also offer information on qualities of certifications that they found important, which would help us to analyze certifications. We communicated with three members of different companies involved with the project: Luis Rodriguez from Dirección de Gestión de Calidad Ambiental (DIGECA: Management Division of Environmental Quality), Seidy Alfaro Gutiérrez from Ente Costarricense de Acreditación (ECA: Costa Rican Entity of Accreditation), and Diego Cordero from Instituto de Normas Técnicas de Costa Rica (INTECO: Costa Rican Institute of Technical Standards). Luis Rodriguez was the head of the government project and therefore was incredibly knowledgeable about environmental certifications. For our interviews, we used semi-structured format.

Our group wanted to gain an idea about the government project's goals as well as learn about attractive qualities and trends in cost and popularity concerning certifications. To that end, we asked the members of the government project about the initiation and objectives of the project. To learn more about certifications, we also asked questions regarding which aspects made eco-labels and certifications efficient and most recognized amongst companies. Because ECA was also an accreditation company, we asked them additional questions about the accreditation process and credibility of environmental certifications. Examples of the questions we asked during our interviews with the members of the government project can be found in

Appendix B. We gathered and analyzed the data using the same methods from objective 1. We used the collected data to gain a better understanding of certifications.

3.2.2 Interviews with Certifying Bodies

In order to gauge additional views on environmental certifications, we interviewed representatives from certification bodies in Central America. We wanted to determine the perspective of organizations that certify products and companies on the cost of certifications, the timeline for certification, the benefits companies can expect upon receiving a certification, and information about certifications available in Costa Rica.

We interviewed representatives of certification bodies from two different countries: Günter Schranz, the executive director of the El Salvador branch of DQS, a German certification company, and Diego Cordero Jiménez, a member of the Costa Rican certification body INTECO. We interviewed Günter Schranz to gain the perspective of an expert on certifications in a different developing country. We interviewed Diego Cordero Jiménez because INTECO is one of the largest certification bodies in Costa Rica and has a history of certifying products in Costa Rica. Jimenez also had a role in the government project on environmental certifications, allowing us to talk to him in multiple capacities.

We conducted semi-structured interviews with both representatives from certification bodies. We asked both interviewees questions about what factors are important for a successful certification, the inner workings of the certification process, and what companies can do to ease the certification process (Appendix C).

3.2.3 Interview with an Expert

In order to determine the opinion of an expert on environmental certifications with perspectives on both the company side and the agency side, we interviewed Mauricio Blandino, an environmental advisor at CICR (Appendix D). His role allows him to gather the opinions of CICR's constituency as well as the government on environmental certifications. Mr. Blandino is very knowledgeable about both sides of the issue so his views are unique.

Our interview was semi-standardized, and our main questions focused on companies' goals and concerns are with certifications, the possibility of government incentives, and important factors in certifications. We recorded and took notes as we did with our other interviews.

3.3 Objective 3: Compare and contrast existing environmental certifications

We compared and contrasted existing environmental certifications in order to develop recommendations for companies on which certifications would be most effective. We first created a list of all the environmental certifications that we encountered, adding in details about each specific certification. We then narrowed down the list, using factors determined to be important by analyzing the data from our interviews. The comparisons allowed us to narrow down the multitude of environmental certifications and to accurately recommend certain ones to companies. We created recommendations in the form of comparison charts and a decision tree, to guide companies to our recommended certifications using a series of questions. The charts and decision tree create visuals to allow companies to more easily make decisions on which certifications to pursue. These deliverables were published on the CICR website to create easy access for companies.

3.3.1 List of Certifications

Before we could start comparing environmental certifications, we created a list of all the certifications that we were able to find. The list gave us a starting point from which we compared the certifications. We included every certification that we found in order to create the largest list possible. A larger list meant that we would not be leaving out any certifications that we might later determine to be highly effective. During our research, we discovered ecolabelindex.com, an online database of 463 environmental certifications that have eco-labels (Big Room Inc., 2016).

When adding certifications to our list, we included specific information for each one to have a base to gauge what each certification was about. The information that we included under each certification was a brief description of what was being certified, the company that published the certification, and the type of organization that assesses conformity to the certification. The description about the certification allowed us to sort the certifications into different categories for what was being certified; the categories we created were building, carbon content, water, energy, carbon neutral, life cycle analysis, and agriculture. We included the company that published the certification to allow us to more easily find more information on each individual certification. We also detailed what type of organization the company was, such as a nonprofit, for-profit, or government organization. This information would help us to determine credibility, as for-profit organizations might place more emphasis on making money than on creating good environmental practices in the companies that they certify. We included the type of organization that determines the conformity to the certification to also determine credibility. There are three types of organizations that can assess conformity: the company receiving the certification, the company that publishes the certification, and an independent organization.

Before we began to narrow down the list of certifications, we determined which factors to consider when condensing the list. It was important to eliminate certifications that would not be effective to create smaller lists for each category of certifications. Smaller lists allowed for easier comparisons between certifications. We determined factors to use to eliminate certifications and compare the remaining ones by analyzing data from our interviews. We already mentioned that we coded this information by theme. We took into account the opinions of not only the companies, but also the certification bodies, government, and experts in the field.

We ranked the remaining certifications as high, average, or low for each factor. We then ranked the findings in order of what we determined to be most important to least important. We used our different rankings to create comparison charts that compared the different certifications and to pick one certification in each category that we perceived to be the best.

3.3.2 Comparison Charts for Costa Rican Industry

After determining the important factors for beneficial and successful certifications we created comparison charts to provide visuals that show how certifications rank in different categories. The charts allow companies to see the different factors that we used in our decisions and to see the pros and cons of each individual certification, as well as a clear comparison to enable companies to make well-informed decisions on which certifications to choose. We based the format of our comparison charts on one created by Coopedota when deciding on a carbon neutral certification, shown in Table 3.1.

Table 3.1: Coopedota's Analysis of Carbon Neutral Certifying Companies (Jimenez, Kilian, and Rivera, 2013)

COOPEDOTA: ANALYSIS OF COMPANIES CERTIFYING FOR CARBON NEUTRALITY, 2011

CRITERIA: MORE IMPORTANT < < < < < < < < < < < < < < LESS IMPORTANT

PLACE	CERTIFIER	BRAND AND CREDIBILITY	EXPERIENCE WITH PAS 2060	FOCUS ON REDUCING EMISSIONS	COST	EXPERIENCE WITH THE COFFEE SECTOR	CUSTOMER SERVICE
1	Carbon Clear	Good	Good	Good	Good	Bad	Good
2	Carbon Neutral Company	Good	Bad	Good	Bad	Good	Good
3	Rain Forest	Good	Bad	Bad	Good	Good	Good
4	Carbon Trust	Good	Bad	Good	Good	Bad	Bad
5	carboNZero	Regular	Good	Good	Bad	Bad	Good
6	Carbon Free Certification	Regular	Bad	Regular	Good	Good	Regular
7	Green Solutions Argentina	Bad	Bad	Bad	Regular	Good	Good
8	NoCO2 Verus Certification Program	Bad	Bad	Regular	Good	Good	Regular
9	Carbon Neutral	Bad	Bad	Regular	Bad	Bad	Regular
10	TÜV SÜD America Inc.	Not enough information	Good	Not enough information	Not enough information	Bad	Bad

Source Coopedota R.L.

Table 3.1 details the way that Coopedota chose the certification body to perform its carbon neutral certification. The leftmost column lists the different certification companies, and the top row lists different factors. For Coopedota, the most important criterium was credibility, so credibility was the leftmost factor. The companies were then ordered based on their credibility. Next, they were ordered based on their experience with PAS 2060, the certification for carbon neutrality. We rated each factor as high, low or average based on research we performed. We determined ratings by comparing the different certifications to each other. For credibility, a credible certification is one that is created by a government or non-profit organization and verified by a third party.

We created our charts using google sheets. After we had the order for the certifications, we used excel to make them more visually appealing (Appendix E). We created a different

comparison chart for each previously mentioned category of certifications. For example, we had one chart comparing different energy certifications and another chart comparing product life cycle analysis certifications. The different charts allow companies to only look at certifications within the category that they wished to become certified in. We sent our final product to Mauricio Blandino, environmental assessor at CICR, who informed us that he would put them on the CICR website. We also created a decision tree which listed our number one certification in each category (Appendix F). The decision tree provided more condensed recommendations and was displayed both on the CICR website and in a pamphlet that CICR could give to company representatives.

3.4 Method Limitations: Interviews

The main problem we ran into during our interview process was gaining access to our intended interview subjects. Many did not respond to emails or phone calls, and we were therefore unable to interview them. For this reason and also because of time constraints, our sample size for Costa Rican companies ended up being a lot smaller than we had intended. The smaller sample size could mean that the results we obtained are not representative of the Costa Rican industry. It was also plausible that questions could be misinterpreted, and the resulting answers would be unclear or would mislead us (Choi & Pak, 2004). To avoid this problem, we made our questions as clear as possible and let the participants know that they could ask us to clarify anything if needed.

The previously mentioned methods have undergone Institutional Review Board (IRB) approval and we have taken measures to ensure the protection of individuals and companies interviewed.

Chapter 4: Findings and Discussion

We analyzed the information that we received in order to enable Costa Rican companies to effectively use environmental certifications. We first detail the difficulties companies run into with a lack of available information about environmental certifications. Then we discuss the factors that companies use to decide whether or not to obtain a certification and one of the major concerns companies have. Lastly we examine regional differences in certifications and the desire for government incentives in Costa Rican companies.

Finding 1: ***Information on environmental certifications is difficult to find.***

We were able to find general information on certifications as a whole through different studies online, but we experienced difficulty in finding more specific information, such as availability in Costa Rica. The most beneficial site where we found over 400 eco-labels was ecolabelindex.com, but it was not clear which were accessible in Costa Rica. It was difficult to determine a relative cost for different certifications because cost varied depending on company size. Factors that impact the cost of certifications, which can all vary based on the size of company, include the required changes made to the company processes (to meet the certification's requirements), the number of facilities that need to be audited during the verification process, and the fee for the certification publisher. We were able to find financial information for companies in countries such as the U.S, but since the companies did not itemize their sales by product, we could not find specific information on ROI for certain certifications. It was difficult to find public information on the internet regarding ROI specifically in Costa Rica. Both Florex and Sykes mentioned savings they acquired after receiving certifications, but the remaining companies that we interviewed were not forthcoming with their financial information.

INTECO also did not have the information on the financials of the companies they certified. Our sponsor stated that a database regarding availability does not yet exist for Costa Rica (M. Blandino, personal communication, 19 April 2016).

Each company representative we spoke to declared they base decisions about certifications on marketing and availability. For example, David Cespedes of Rectificación Alajuelense said that despite seeing that they may eventually need environmental certifications, they were unable to get enough information on them to make decisions. In our interview with INTECO, Diego Cordero explained how certifications are new in Costa Rica and there is no database for availability yet. Holcim, Ecoclean, and Rectificación Alajuelense, the three companies that were not certified with Type 1 or Type 3 certifications, said that lack of information was part of the reason they have not obtained any certifications yet.

Small companies are unsure if they will be able to obtain certifications because they do not know the requirements or cost (I. Moya, personal communication, 12 April 2016). Because it was difficult to obtain information on existing certifications, Ecoclean and Holcim each made their own Type 2 certification. (A. V. Herrera, personal communication, 7 April 2016; I. Moya, personal communication, 12 April 2016). Both representatives obtained their own certifications to show their consumers their products had less of an impact on the environment.

Although certifications signal a product's or company's environmental sustainability, consumers might not understand what they mean (A. V. Herrera, personal communication, 7 April 2016). A focus group that Holcim conducted determined that although consumers like to know what companies do to improve the environment, they do not usually understand what numbers on labels mean. Herrera said that without proper knowledge, customers might buy products labeled with vague or inaccurate information because they would not be able to

differentiate between legitimate and illegitimate claims (A. V. Herrera, personal communication, 7 April 2016). Throughout our interviews, we found that consumers and companies experienced difficulty in finding proper information on this topic, discouraging businesses from pursuing certifications and reducing consumer's likelihood to pay more for certified products.

Finding 2: ***Companies base their decisions about specific environmental certifications on five factors.***

We found that companies consider the same five factors when contemplating which certification to pursue: return on investment (ROI), cost, consumer recognition, credibility, and specificity. A visual representation of our five factors is below in Figure 4.1.

Figure 4.1: Five Important Factors in Certifications. The five factors we identified as important, in no particular order.

These factors were used to construct our comparison charts seen in Appendix L. An example of one of the comparison charts, the Building Certification Chart is shown below in Table 4.2.

Table 4.2. Building Certifications Comparison Chart: Comparisons between different building certifications available in Costa Rica. The certifications are ranked as RESET, then LEED, and then BREEAM

Certification	RESET (Requisitos para edificios sostenibles en el tropico)	LEED (Leadership in Energy and Environmental Design)	BREEAM (Building Research Establishment Environmental Assessment Method)
Eco-Label			
Standards	*socioeconomic factors, transport, spacial quality, floors and landscape, materials, water efficiency, energy optimization*	*integration process, location and transportation, sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation, regional priority*	*energy efficiency, carbon output, design durability, ecological value*
Applicability to Tropical Areas	HIGH	LOW	LOW
Recognition	LOW	HIGH	AVERAGE
Credibility	HIGH	HIGH	HIGH
ROI	HIGH	HIGH	HIGH
Cost*	LOW ($500+/m2)	HIGH ($2000-4000/m2))	NO INFO
Specificity	HIGH	LOW	HIGH

We constructed this chart by classifying each factor listed above as high, average, or low for each certification. We determined the recognition of a certification by assessing the number of countries in which it used and how many companies have the certifications. When cost and ROI information were available we compared them to each other and decided which were high and which were low based on the costs of other certifications within the same category. We indicated in the chart if information on cost and ROI was not readily available. We ranked credibility by whether the certification was third party verified, what kind of organization published it, and how well defined the standards were. We determined specificity by assessing how explicitly the certification stated its standards. For example, we rated LEED certification as average specificity because the standards are not as well defined as those of RESET and BREEAM. From this chart, the best building certification is RESET because it has the best standards for a tropical country and is therefore best suited to Costa Rica. The raw data we used to construct the comparison charts is in Appendix G.

Return on Investment

One of the most important factors in a company's certification choice is the return on investment, the profit a company makes from a venture expressed as a percentage of the original cost. In some cases, especially with certifications, the increased profit companies experience is actually the savings accrued from implementing more environmentally sustainable measures (G. Schranz, 2016; G. Blanco, 2016). Companies want to maximize their ROI, but a costly investment could deter them from a promising return. In our chart, we determined high, average, or low ROI by comparing the ROIs of each standard within a category to others in the same category. Those with comparatively high ROIs ranked high, those that were comparatively low ranked low, and the ones in the middle ranked average. When quantitative data was not available, we used assessments from other sources on the internet.

Both of the Type I certified companies we interviewed (Florex and Sykes) alluded to the savings or profits they made after receiving their certifications. Silvia Chaves from Florex, talked about an increase in sales after the company received its certifications (ISO 9001, ISO 14001, and INTE 12-01-06). Florex has experienced annual growth of 30% since acquiring their ISO certifications in 2010 (S. Chaves, Personal Communication, 14 April 2016). Guillermo Blanco from Sykes noted that Sykes saved about four times what it paid to receive the Costa Rican Carbon Neutral certification (INTE 12-01-06), which corresponds to a 300% ROI (G. Blanco, Personal Communication, 14 April 2016). A return of 300% indicates that for every dollar they spend to stay certified, they save four dollars. Despite realizing that they might not receive any new clients from the certification due to the nature of the service industry, Sykes chose to pursue a carbon neutral certification because it saved money in energy costs.

Günter Schranz of DQS, a German third party certification body that operates in Central America, elaborated on the savings aspects of some ISO certifications. He explained that ISO 9001 is the "traditional certification to save money," because it requires a company to rethink its production process to more effectively allocate resources, thus reducing costs (G. Schranz, Personal Communication, 11 April 2016). ISO 50001 grants a very quick return in savings. For example, DQS ran a training program for ISO 50001 at the cost of $2,000. DQS measured the company's energy consumption at the beginning of the program and after six months. Two particular companies saved over $350,000 and $180,000 respectively, each recuperating the $2,000 expense many times over (G. Schranz, Personal Communication, 11 April 2016).

Cost

Despite the possibility of high returns, the costs of pursuing a certification deter smaller companies. We used a measure of relative cost to assess high, average, or low. To measure relative cost we compared the fee for each certification in a category and ranked highest to lowest. We rated the high ranking certifications as high, the mid-ranking certifications as average, and the low ranking certifications as low. In cases where we were unable to find any information on cost we gave the "no information" label. Without the same resources as companies such as Sykes and Florex, certifications might not be economically feasible to smaller companies with less capital. The costs of implementing certifications come in two forms: the fee for obtaining the certification and the cost of meeting the production and operation standards of the certification; however the latter varies depending on the size of the company. For example, Sykes did not need to pay a fee to obtain INTE 12-01-06 (Carbon Neutral certification), but does spend $25,000 annually to implement the carbon neutral process. The cost to implement and obtain certifications is often the first aspect that companies, especially small companies,

investigate. Representatives from the two smallest companies we interviewed, Ecoclean and Rectificación Alajuelense (with nine and ten employees respectively) listed cost as one of the top two most important criteria. David Cespedes, the manager of Rectificación Alajuelense, noted that cost is the first aspect the company analyzes and that the company will stop considering a certification if the cost is too high (D. Cespedes, Personal Communication, 15 April 2016). Isabel Moya, head of board and former general manager at Ecoclean, said cost is an important factor when determining certifications to pursue (I. Moya, Personal Communication, 12 April 2016).

Recognition

Another important factor is the reputation of a certification and recognition of its label in its target market. To assess a measurement of recognition we looked at the number of countries in which the certification was available, and how many companies already obtained the certification. Similarly to ROI and cost, we ranked recognition compared with other certifications in the same category. In two of our interviews with representatives of small companies, Andres Villalobos Herrera from Holcim and Isabel Moya from Ecoclean, they stated that they rely on word of mouth from their consumers in the region to advertise their products (A. V. Herrera, personal communication, 7 April 2016; I. Moya, personal communication, 12 April 2016). Ecoclean has its own labels but are not recognized because there is "no entity that will actually recognize those labels", meaning that its labels do not help the company's image in the same way as a widely known label (I. Moya, personal communication, 12 April 2016). Companies look for a certification that is well-known to consumers with recognized standards.

In our interview with DQS, Günter Schranz stated, "Smart companies choose a certification company that is known by [identifying which] market they want to penetrate, so the

clients know where certification comes from" (G. Schranz, personal communication, 11 April 2016). He also made a comparison between the increased likelihood of hiring students that come from well-known universities to companies more likely choosing certifications based on high recognition. The companies we interviewed stated that they realized the importance of having a label that is well-known and respected. For example, of the 268 certifications INTECO has given to businesses, 227 or 85% of them are ISO standards, which are some of the most recognized standards in the world (INTECO, 2015). By obtaining widely known certifications, a company's brand receives recognition from consumers. Recognition translates into increased sales because consumers support the brands they prefer, and that recognition is important to businesses when selecting a certification.

Credibility

We heard in eight out of our ten interviews that certifications verified by independent, accredited companies are more credible to businesses and the public. In our chart, we gave high credibility to third party verified, certifications published by nonprofit organizations or the government, average credibility to third party verified certifications published by for-profit companies, and low credibility to non-third party verified certifications. A certification is most credible if it is verified by a third party auditor rather than the certification publisher because the auditor has no financial interest in whether or not the applicant receives the certification (L. Rodríguez Ugalde, personal communication, 4, April 2016). Certifications are more credible if the third party organization that completes the verification is accredited. In our interview with ECA, Seidy Alfaro Gutiérrez asserted that companies look into whether or not a certification body is accredited when pursuing certifications (S. Alfaro Gutiérrez, personal communication, 18, April 2016). By choosing an accredited certification body, a company adds further credibility

to that particular certification by guaranteeing that the audit, the verification that all standards of the certification are followed, will be acceptable. In all of our interviews with business representatives from companies, we found that credibility of labels was one of their paramount criteria for choosing certifications.

Specificity

A lack of specificity in a certification erodes its credibility. We gave high specificity to certifications with well-defined and strict standards, average ratings to certifications that do not explicitly state their definitions, and low ratings to certifications with very little elaboration on their standards. From our interview with Andres Villalobos Herrera from Holcim, we found that well defined standards for what makes a product environmentally friendly do not exist for some products. He stated, "There are no standards currently defined for what makes "green" cement" (A. Villalobos Herrera, personal communication, 7, April 2016). The problem arises when certifying the cement; if the certification does not have specific standards that explicitly state what constitutes "green cement," there is no way for consumers to know what the certification means. This example speaks to a measure of vagueness that Luis Rodríguez Ugalde noted in our interview with him. According to Sr. Rodríguez Ugalde, vague certifications do not send a good message, and that there may be misinformation hidden within the ambiguity (L. Rodríguez Ugalde, personal communication, 4, April 2016). In his view, only a small percentage of certifications are specific enough to be called trustworthy. Sr. Villalobos Herrera further stated that consumers like to know what companies are doing to improve the environment, but do not understand the specifics of what labels accomplish (A. Villalobos Herrera, personal communication, 7, April 2016). Many companies can say that their products are environmentally friendly, but there are different levels of this claim. For example, a carbon eco-label shows a

company produces less than a certain number of grams of carbon dioxide. However, consumers do not know how many grams companies produce on average and therefore do not know if the label is a good measure or not. Without clear standards for certifications to follow, it is difficult for consumers to understand how sustainable a product is.

The above factors contribute to a company's decision about whether or not to pursue a certification. The ideal certification has high ROI, low cost, high recognition, high credibility, and high specificity. Flaws in cost, recognition, credibility, and specificity serve to deter companies from pursuing a certification. But for a high enough expected ROI, companies will overlook some of the flaws in a specific certification.

Finding 3: ***Greenwashing is a primary concern when pursuing environmental certifications***

Greenwashing concerns companies because making legitimate changes to improve environmental sustainability could go unnoticed or create a bad image for environmental claims. Greenwashing ranges from a label change of a product containing harmful chemicals to false advertisements to appear environmentally sustainable. Representatives from four out of the five companies we spoke with pointed out concerns with greenwashing. Companies worry that their competition will misleadingly promote environmental friendliness, falsely increasing reputation and taking consumers away from companies that actually are environmentally sustainable. The main concern that companies have with greenwashing is that false environmental claims will cause companies that actually work to improve their environmental sustainability to lose competitiveness in the market (Furlow, 2010).

Company representatives voiced concerns that competition would find easier ways than obtaining a certification to boost reputation by greenwashing. We discussed these in our

interviews with Holcim, DIGECA, and Ecoclean. Andres Villalobos Herrera of Holcim expressed that it was easier for a company to trick customers into thinking the business is environmentally friendly than to actually change the business's processes to be environmentally conscious. For example, Herrera said it would be much cheaper and quicker for a company to participate in a river or beach clean-up when compared to obtaining an eco-label, and the clean-up would result in higher recognition and public relations. He was concerned that the process of company greenwashing would invalidate efforts towards achieving environmental certifications. He worries that consumers will ignore companies that actually make progress towards environmental sustainability in favor of those who heavily market small actions (A. V. Herrera, personal communication, 7 April 2016).

Isabel Moya of Ecoclean further worried that companies could certify fractions of their business or products and still use the associated eco-label. She gave the example that a company could choose to certify only the container of their product and still include an eco-label that appears to represent the entire product (I. Moya, personal communication, 12 April 2016). Although our team could not gather evidence to validate her claim, it brings up additional concerns about the validity of certifications. Isabel did not specify if her concern about label misuse applied to all certifications or just a few. She stated that "there's no way to guarantee that my competition is not cheating and selling something under the same label that I am without the same quality control or the same responsibilities" (I. Moya, personal communication, 12 April 2016). However, third party verified certifications do not allow different companies to receive the same certification under different conditions (Unite for Sight, 2015).

Although companies have concerns about legitimacy and how false marketing can undermine companies who get official eco-labels, a more in-depth look into the topic brought up

a different result. Additional research uncovered that greenwashing through highly marketed actions and misleading labels actually lessens consumer trust of green products because consumers become skeptical about environmental claims (Nyilasy, Gangadharbatla, & Paladino, 2013). However, as consumers become more suspicious, companies with substance behind their claims will not crack under scrutiny. Strong certifications with clear standards tell consumers that a company's environmental claims are authentic and will maintain consumer trust while greenwashed companies lose customer faith (Honey, M, 2002). By obtaining third party certifications, Costa Rican companies can move forward in a market that increasingly prefers environmentally conscious products while holding up against scrutiny.

Finding 4: ***There are regional differences in the prevalence of environmental certifications***

Different regions of the world tend to use different kinds of environmental certifications and have different levels of consumer awareness. Knowledge of regional differences is particularly important for companies in Costa Rica that choose to export products or have international services because selecting the right certifications for a specific region can increase recognition for a business. When businesses choose to get certain types of certifications for a particular region, the certifications increase in popularity. The rise in popularity in turn increases the recognition of the companies using the certifications, and generates a cycle where company and certification recognition in a region support each other's growth. In Europe, Type 3 life-cycle certifications are widely used on products. Therefore, a company who exports to Europe would benefit from using a Type 3 label. In North America, Type 1 labels are the most commonly recognized (L. Rodriguez, personal communication, 4 April 2016). Certifications are not currently prevalent in the regions of Central America and South America due to a general

lack of public knowledge concerning certifications (I. Moya, personal communication, 12 April 2016).

Multiple interviewees stated that there was a lack of consumer knowledge and recognition of environmental certifications in the Central American region. Andres Villalobos Herrera from Holcim stated that people don't currently know or care enough about certifications. He said price was the primary selling point for the cement market in Costa Rica and that consumers did not care if his company was certified or not (A. V. Herrera, personal communication, 7 April 2016). Isabel Moya of Ecoclean declared that although environmental certifications were important for being environmentally conscious, she could "have the best eco-label in the world [but], if no one knows about it, [it would] be [just] another sticker in the supermarket" (I. Moya, personal communication, 12 April 2016).

Florex had a different opinion on the matter of consumer recognition. In our interview with Florex, Silvia Chaves said that her company's usage of ISO 9001 and ISO 14001 had definitely changed Florex's reputation in the Central American market (S. Chaves, personal communication, 14 April 2016). Her statement contradicts the opinions of Sr. Villalobos Herrera and Sra. Moya, and we believe this difference exists because ISO standards are naturally more recognizable in the market due to their prevalence and because Florex exports to the rest of Central America. The prevalence of the ISOs is comparable to the USDA Organic standards because the Organic label also has widespread usage on products and has established a familiarity with consumers (USDA, 2014). Even though Florex only exports to Guatemala and Panama, there still could be a discrepancy that exists with the amount of consumer knowledge between Costa Rica and other countries in Central America.

Although we only interviewed representatives from five Costa Rican companies, which may not be a large enough sample to represent the country's industry, we believe that lack of consumer knowledge in the Central American region is a legitimate concern for companies in Costa Rica. While countries like Costa Rica praise themselves for being environmentally conscious, a lack of consumer education or public promotion of certifications, regardless of whether or not the people of Costa Rica are considerate of the environment, could be causing company concerns (Mauri, 2009).

Finding 5: ***Government incentives for environmental certifications make companies more likely to obtain effective certifications***

Government incentives, rewards given by the government for pursuing certifications, are a way of encouraging companies to pursue certifications. Representatives from multiple companies told us they would be more likely to obtain a certification if it were incentivized by the government. Andres Villalobos Herrera said that his company would put government incentives, such as making a company a preferred supplier, as a top priority when considering potential environmental certifications. Mauricio Blandino and Luis Rodríguez Ugalde told us that incentives are necessary for galvanizing the use of certifications by small businesses. According to Mr. Blandino, companies will rarely engage in a certification scheme without an incentive (M. Blandino, personal contact, 19, April 2016). Luis Rodríguez, a member of the Costa Rican government, believes that the Costa Rican government could implement incentives for companies to receive certifications.

Additional research highlighted incentive programs in nations around the world that Costa Rica could use as models. For example, cities and counties in the United States have various benefits for using LEED, including tax breaks on construction projects and fee

reductions when acquiring the LEED label (USGBC, 2009). In France and Sweden, there are a variety of government incentives for companies to become certified under ISO 50001, including reductions in the cost to gain the certification (CTI, 2013). India provides incentives for micro and small sized enterprises to implement certain energy management schemes: ISO 9000, ISO 14001, and HACCP certifications. Micro and small companies can receive a reimbursement of up to 75,000 rupees ($1124.017) for any of the certifications from the Ministry of Micro, Small, and Medium Enterprises. From October 2002 to March 2015, 26622 micro and small companies collected reimbursements from the Ministry of Micro, Small, and Medium Enterprises (Govt of India, 2016). The success of a government incentive program in an industrial nation such as India indicates that Costa Rica could experience a similar result.

Limitations

Although we had a small sample size, we got enough data to be able to fulfil our project goal by allowing for the most information per interview. However, the small sample size could mean that the results are not representative of the Costa Rican industry as a whole. By only talking to five companies, we may have missed important information. Further research could involve talking with representatives from a much larger sample of Costa Rican companies to gain a better perspective of how they view certifications and what hesitancies the companies may have as a whole.

Chapter 5: Recommendations:

Using the information we discovered, we created four recommendations to enable Costa Rican companies to evaluate environmental certifications. Our recommendations are outlined in Figure 5.1.

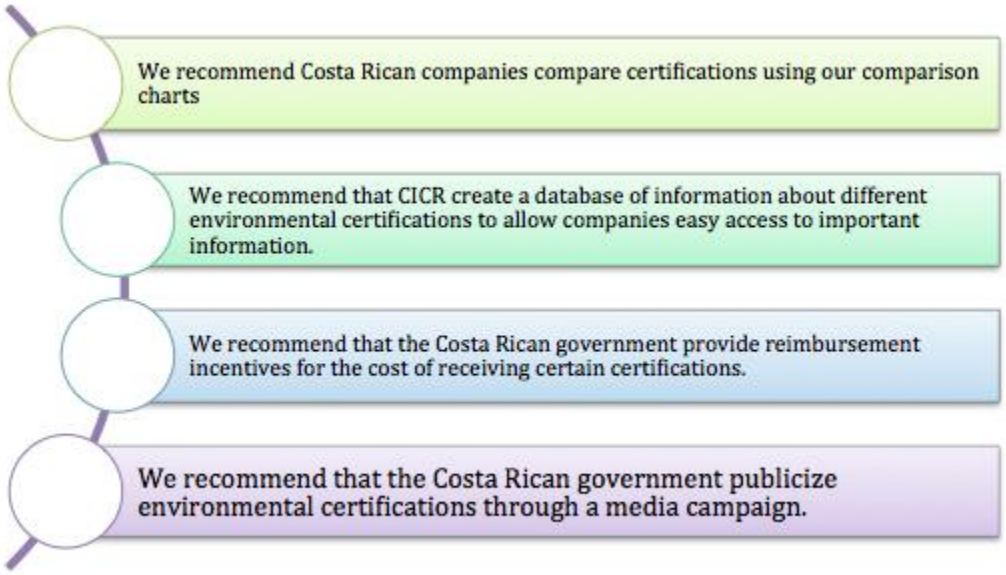


Figure 5.1: Recommendations

Recommendation 1: ***We recommend that Costa Rican companies compare certifications using our comparison charts***

In order to make a well thought out decision, companies should use our comparison charts to guide them in comparing the benefits of each certification. The comparison charts should be a company's first consideration in the certification process. To narrow down the spectrum of certifications that companies can apply for, we organized our certification charts into seven environmental areas: agricultural, energy, carbon neutral, carbon product, water, building, and life cycle analysis. A company can first choose which category they want then choose a

certification from that specific chart based on the company's preferences. Our categorized charts are in Appendix E.

Our comparison charts will be available on the CICR website. There will be a tab for environmental certifications to bring companies to the charts. There will then be different links for each category so companies can more efficiently navigate the site. Companies can also find links to the certification website and the certification body that they can contact for certification. To use our chart, companies can either compare the benefits of each factor in the charts as a whole, or choose the most important factor listed in the columns and compare each label. The analysis and presentation of our comparison charts will make it easier for companies to review the requirements before planning to pursue any labels. An example of how to use our charts is below in Table 5.1

Table 5.1: Comparison Chart of Building Certifications

Certification	RESET (Requisitos para edificios sostenibles en el tropico)	LEED (Leadership in Energy and Environmental Design)	BREEAM (Building Research Establishment Environmental Assessment Method)
Eco-Label			
Standards	*socioeconomic factors, transport, spacial quality, floors and landscape, materials, water efficiency, energy optimization*	*integration process, location and transportation, sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation, regional priority*	*energy efficiency, carbon output, design durability, ecological value*
Applicability to Tropical Areas	**HIGH**	**LOW**	**LOW**
Recognition	**LOW**	**HIGH**	**AVERAGE**
Credibility	**HIGH**	**HIGH**	**HIGH**
ROI	**HIGH**	**HIGH**	**HIGH**
Cost*	**LOW ($500+/m2)**	**HIGH ($2000-4000/m2))**	**NO INFO**
Specificity	**HIGH**	**LOW**	**HIGH**

To use our building chart, companies can look at rankings on factors that are important to them. For example, if specificity was the most important factor to a company, the company can

rule out LEED since RESET and BREEAM both have higher specificity. If applicability to tropical areas is their second most important factor, they can then choose RESET since it has a more applicability than BREEAM.

We further analyzed our comparison charts to choose one certification in each category that we believe is most beneficial for Costa Rican companies. The certifications that we recommend to all interested Costa Rican companies in the environmental categories are outlined below in Figure 5.2.

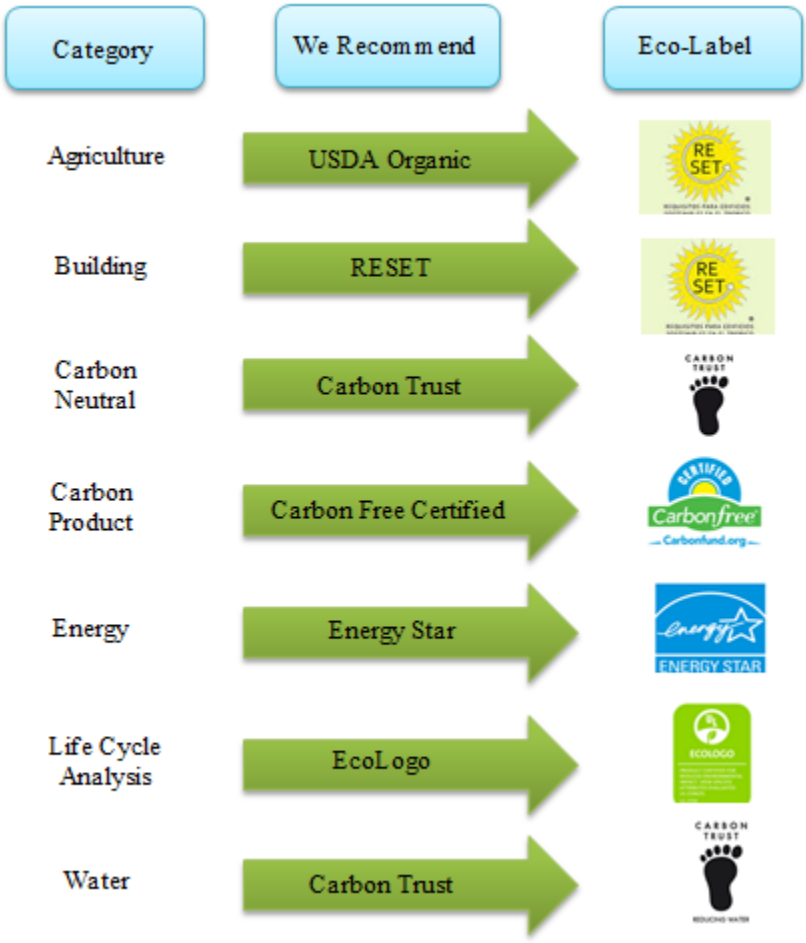


Figure 5.2: Recommended Certifications. The environmental certifications that we recommend for each category of certification.

We condensed our recommendations into a decision tree, shown in Figure 5.3. Companies can use the decision tree to choose a certification if they are not sure which category of certification they want. The first question asks if the company wants a company, product, or building certification, allowing companies to reduce the certification categories. A later question asks where the company's target market is, further narrowing which kind of certification they should obtain. Lastly, the company chooses a category from the simplified list, which points them directly to a specific certification.

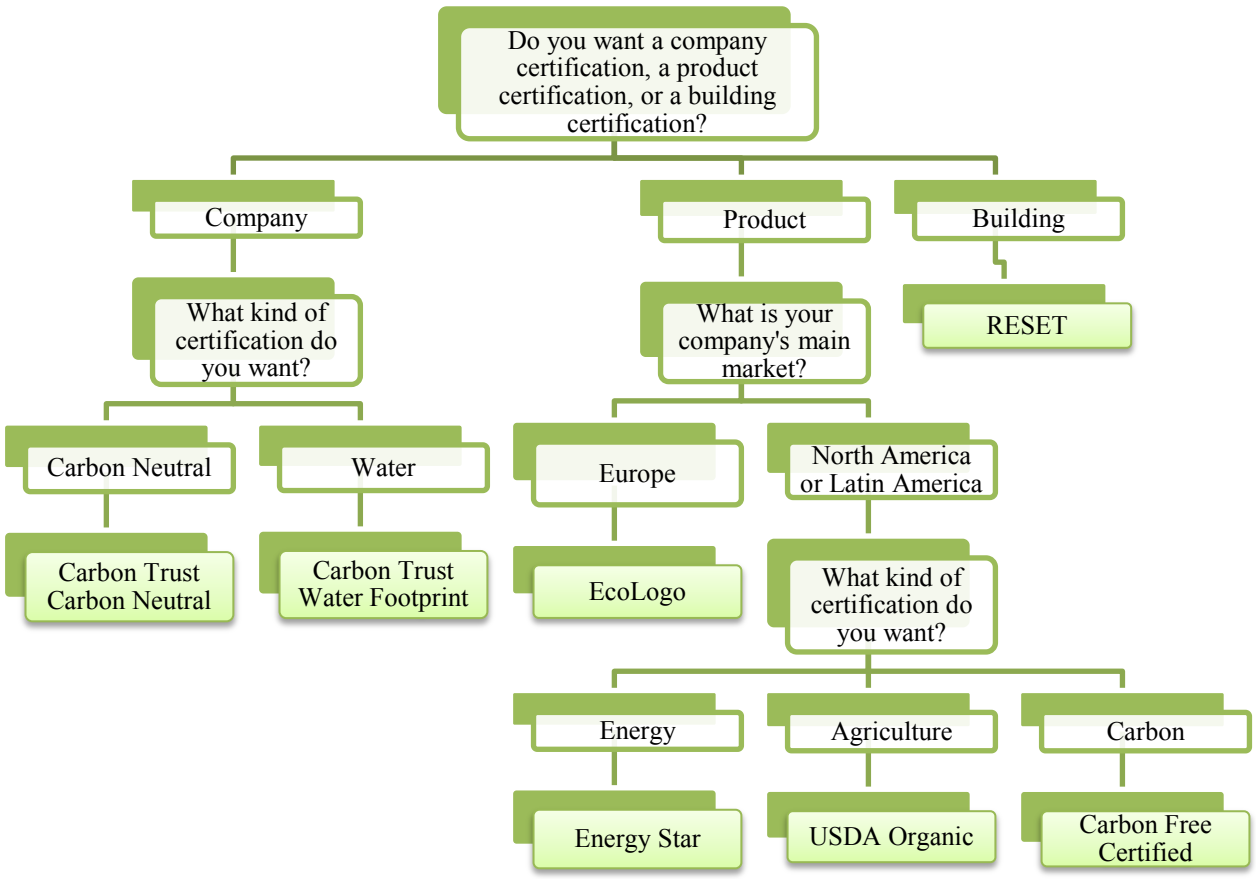


Figure 5.3: Decision Tree

Along with these specific certifications, we also universally recommend that companies pursue International Organization of Standards (ISO) certifications. ISO certifications are a group of company certifications for a wide variety of aspects, such as quality management, environmental management, and energy management. ISO standards are well-recognized and, even if they don't increase company profits, will usually help save money by increasing company efficiency (G. Schranz, Personal Communication, 11, April 2016). We recommend that businesses analyze the potential benefits of ISO 9001 (Management standard), ISO 14001 (Environmental Sustainability Standards), and ISO 50001 (Energy Efficiency Standards) in particular, as these are some of the most well-recognized ISO certifications.

After choosing a certification, a business should first contact the company that publishes the certification to ask about the certification process and obtain a price quote. The publishing company would help the business through the steps of meeting the certification's standards. The business should then perform an internal review to make sure its practices meet the standards of the certification. Next, the business should contact an accredited third party certification body to perform an audit and confirm that the business meets the certification's standards, after which the business would receive the certification (S. Alfaro Gutiérrez, personal communication, 18, April 2016).

Target Market Recommendations:

We determined which certifications the companies we interviewed should obtain based on regional preferences. The five companies we interviewed including Holcim, Rectificación Alajuelense, Sykes, Florex and Ecoclean, we made recommendations on certifications we believe they should pursue since most of the representatives were not currently looking into any.

Because Holcim does not export and has already done work to reduce their CO2 emissions we recommend they obtain a well-recognized carbon label that is well recognized in Costa Rica such as Carbon Trust Product Footprint Certification. Rectificación Alajuelense currently has no certifications but produces products with a high environmental impact, so we recommend they also get a Type 1 label on their products such as Carbon Trust Product Footprint Certification due to its high recognition in Central America. We believe Sykes, an international services company should focus their interest on ISO 50001 and also Carbon Trust Water Footprint Certification because they want to measure their water content. We recommend they continue to pursue both. Lastly, because Florex and Ecoclean both export to Central America and produce cleaning products we recommend they obtain the government label coming out for cleaning products, which will hopefully be widely recognized in Central America. Overall, our recommendations for the companies we spoke to varied depending on their target markets and environmental category of their products and can be used as a model for similar types of companies.

Recommendation 2: ***The Cámara de Industrias should provide information on available certifications to the public and private sector***

We believe that CICR should provide information to fill the gaps in our research to help alleviate companies' concerns and hesitancies, and to provide a legitimate source of data. CICR is particularly qualified to make such as database because they represent over 700 companies and their website would reach a large number of businesses (M. Blandino, personal communication, 19 April 2016).

To collect information on individual certifications, CICR can conduct extensive research and contact companies that publish or have environmental certifications. They should find out

what kind of company publishes the certification, such as nonprofit, for-profit, or government. They should also determine whether the certification is third party verified. By talking to companies of varying sizes with the same certification, CICR can compile information on the cost of meeting the certifications standards and the fee for obtaining the certification. Companies will also be able to give information on the ROI of specific certifications. CICR should also speak with certification publishing companies to get data on the number of participating countries and companies to gauge recognition. The certification publishing companies will also be able to shed light on exactly what the certification's standards are to determine how specific the standards are. Companies can then use the database to learn specific details about the certifications in our comparison charts.

We consider the lack of information and the existence of concerns about the legitimacy of certifications to be serious issues. These issues were stated by company representatives during our interviews and observed during our research. Throughout our project, we were unable to find a proper source to find all the information we needed. Although there was a source called "ecolabelindex.com", with basic summaries of each certification and links to their official websites, it was still not detailed enough to accurately compare the certifications. By looking at the websites of each certification and analyses of certified companies, our team was able to gather the data needed to form our comparison charts, but we were still left with gaps in information on several details.

We suggest that CICR divide the formation into categories between Type 1 and Type 3 certifications because they are the two most important and credible types of labels for companies. For Type 1, the database should include a picture of what the declaration looks like when placed on a product, to give companies information about what label they will be

displaying to their consumers. The database should also include a relative cost range, relative ROI, how the certification is verified, and a list of the official standards of the label, giving companies some basic information of each certification in this category. Type 1 certifications should also have information listed about what year the label was created to let companies know how much the certification's company is established and experienced in the industry. Along with information that is listed for Type 1 certification as well, Type 3 labels should also have relative cost listed as this can be a limiting factor for companies.

When placed on CICR's website, the certification database should be put under a tab on the main page of the site labeled "Environmental Certifications Information." The tab should also contain our previously mentioned comparison charts and decision tree. By using our chart and the database combined, companies can thoroughly understand which certifications are most effective, helping to eliminate the issue of hesitancy in the Costa Rican industry.

Recommendation 3: ***The Costa Rican government should incentivize environmental certifications for small companies to increase the rate of implementation.***

We recommend that the Costa Rican government create a program to incentivize environmental certifications by reimbursing small companies for the costs of obtaining specific certifications. We discovered in Finding 2 that small companies would benefit from help with the costs of certifications because they have less capital than larger companies and are therefore discouraged from pursuing costly certifications. The program would encourage companies to become more environmentally sustainable to achieve certifications. We believe a government reimbursement program for the cost of obtaining a certification would be most effective because

most certifications require processes that save money in the long run, eliminating the need for aid after the implementation of a certification (G. Schranz, 2016; G. Blanco, 2016).

Multiple companies spoke about wanting a government incentive program for environmental certifications. Certification cost combined with consumer unawareness has prevented all three of the small companies we spoke with (Holcim, Ecoclean, and Rectificación Alajuelense) from obtaining well-recognized certifications, indicating that government aid in cost would encourage more small companies to pursue certifications. A reimbursement would help companies of all sizes to justify the cost of obtaining a certification and lead to higher rates of certification implementation. By incentivizing certain certifications, the government can encourage companies to pursue the most effective certifications.

We recommend the government provide reimbursement for the certifications that we determined to be most effective: Carbon Trust Water, Energy Star, Carbon Clear, Carbon Free Certified, EcoLogo, RESET, and Fair Trade. Incentivizing these certifications will urge companies to pursue the certifications that will have the most positive effects. To help small companies obtain certifications, the program would provide monetary aid to smaller companies. The program will use the same cutoff for small companies as taxes, which define a small company as a business whose gross income is less than 105,241,000 Costa Rican colones (CRC). The smallest tax bracket, which includes companies with income up to CRC 52,320,000, would receive the most aid, at up to a certain percentage of the fees. The next bracket, composed of companies with income from CRC 52,320,000 to CRC 105,241,000 would receive less aid at up to a smaller percentage of fees (Worldwide Tax Summaries, 2015). The highest tax bracket would not receive aid for the cost of obtaining a certification, as they can most likely afford certifications on their own.

The money to be used as aid for smaller companies should come out of a government fund that already exists for the purpose of developing small companies (M. Blandino, personal communication, 19 April 2016). As environmental certifications increase the marketability of a company, obtaining certifications will allow small companies to gain higher profits and further develop from increased monetary gain and refined procedures (Testa, Iraldo, Vaccari, and Ferrari, 2015).

Recommendation 4: ***Government should publicize environmental certifications to spread awareness and knowledge to consumers about environmental certifications.***

The government can help to alleviate issues such as lack of awareness and green washing through a public ad campaign, since the government can reach consumers on a national level, which is outside the means of the companies we talked to. By spreading information about certifications, the government will increase consumer recognition. Our data from Finding 2 indicates that companies do not want to invest in environmental certifications because of a lack of awareness. The lack of awareness we discovered in Costa Rica about certifications worries companies that consumers will not buy certified products. The government has a further interest in spreading awareness about certifications because it is currently working to develop a cleaning product certification for Costa Rican companies. The government adds an indirect incentive to obtaining certifications by raising consumer awareness; if consumers start buying certified products, companies will be more likely to pursue them.

An ad campaign may also reduce the effects of greenwashing by shedding light on more rigorous certification practices. Evidence proves that mass media campaigns do work to change the behavior of their targets, but often they fail due to underfunding (Snyder & Hamilton, 2002;

Fishbein, Hall-Jamieson, Zimmer, von Haeften, & Nabi, 2002). Therefore, a government funded ad campaign will work as long as the government commits to it.

Underfunding may be an issue in that advertising is expensive. On thecostaricanews.com, the cheapest option for one month's worth of advertising is over 100 United States Dollars (The Costa Rica News, 2012). One hundred dollars sounds cheap, but it is for just one ad on one website. Furthermore, on popular television channels advertisements can cost over $13,100 per thirty second ad, while local news ads are cheaper at $200-$1500 (Severson, n.d.). To be effective, the government must spread as much information as possible. A good way to advertize is to use newspaper and television ads to raise awareness about certain aspects of certifications, such as what environmental certifications are, where they can be found, and why they are important. Unfortunately, television and newspaper ads, though far reaching, are very expensive and only offer so much information (Becket, 2016). To address the cost issue, the ads should contain as much information as possible, and should mention that certifications are ways for companies to demonstrate sustainable behavior and that consumers should look for certifications verified by a third party organization. Certifications can be on everyday products, so consumers should look for them in the local supermarket. Certifications are important because they guarantee that a company or product follows environmentally sustainable practices. The government may use some ads to promote the government certification as well when the certification is published; however, further research should be done to determine whether it would dilute the intended purpose of the campaign. The ads should direct the audience to a website that contains more details, such as which specific certifications are most credible and which standards have the most explicit standards. It is important to note that the ad campaign

cannot mention any specific products or companies and should only mention the benefits of certifications in order to treat all companies fairly.

Chapter 6: Conclusion

Our project enabled companies in Costa Rica to begin the process of becoming environmentally certified. To do so, we created seven different comparison charts that companies could use to compare certifications before choosing their best fit. We used the information we gathered in the comparison to construct a decision tree that more concisely points to specific certifications. The comparison charts and decision tree allow companies to choose a certification, and we provide additional information on how to begin the certification process. We kept our project broad with many categories of certifications in order to create general comparisons and groundwork for further research that CICR can conduct. We recommend that CICR compile a database of certifications based on our research to address the lack of information available to companies and consumers. To raise consumer awareness, the Costa Rican government should engage in an advertising campaign stating the benefits of certifications. The government should also increase the accessibility of certifications to small businesses by offering reimbursements to small businesses for the costs of obtaining a certification.

Because a short time frame and lack of responses from companies hindered our project, we recommend further research. Because we were only able to interview representatives from five industrial companies, we recommend additional research into what would make companies more likely to pursue environmental certifications. We suggest further research into consumer awareness and preference both in Costa Rica and its largest export markets: North America, Europe, and the rest of Central America to more accurately determine regional preferences in environmental certifications.

The creation of our recommendations developed tools to enable Costa Rican companies to make decisions on which certifications to pursue. Through the implementation of

environmental certifications, Costa Rica will take a large step towards forming a sustainable market, which in turn will work towards creating an environmentally conscious society. Certifications will allow consumers to recognize Costa Rica's environmental efforts, allowing the country to become a powerful force in the global market.

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Appendix A: Interview Questions for Company Representatives

We are a group of students from WPI in Massachusetts. We are working with Cámara de Industrias de Costa Rica and conducting interviews with business owners around the world to find trends in what kind of certifications businesses pursue, and which can be implemented in Costa Rica. Your insights will be extremely useful.

Your participation in this interview is completely voluntary and you may withdraw at any time. If you would like, we would be happy to include your comments as anonymous, though it would be useful for readers to understand which company is providing the answers.

If interested, a copy of our results can be provided at the conclusion of the study. Your participation is greatly appreciated.

1. What is your role in [company]
2. How long has [company] been looking into environmental sustainability?
    a. What exactly is your interest in environmental sustainability?
3. Do you have any environmental certifications?
    a. If yes:
        i. Why did you choose that particular certification?
        ii. What were the main obstacles you ran into in the process of receiving the certification?
        iii. Did your company need to make any changes before getting the certification?
            1. If yes: Was there cost associated with the changes? How much?
        iv. Have there been changes in the reputation of your company after receiving the certification?
    b. If no: Did your company ever look into any certifications?
        i. If yes: Why did you choose not to pursue any?
4. Would you be interested in environmental certifications?
    a. Why or why not?
    b. If yes, do you have any in mind that you would pursue?

5. What region of the world is[company's] target market?
6. What is [company's] strategy with environmental sustainability and certifications?
7. What do you think is important in an environmental certification?
8. Do you know anything about the government project about environmental certifications?
9. If the government gave incentives for environmental certifications, would you be more likely to pursue a certification?

Appendix B: Interview Questions for Members of Government Project

We are a group of students from WPI in Massachusetts. We are conducting interviews with members of MINAE. Our ultimate goal is to determine the goals and methods of the government project regarding eco-labeling, and your insights will be extremely useful.

Your participation in this interview is completely voluntary and you may withdraw at any time. If you would like, we would be happy to include your comments as anonymous, though it would be useful for readers to understand who is providing the answers..

If interested, a copy of our results can be provided at the conclusion of the study. Your participation is greatly appreciated.

1. What is your role in the government project?
2. What can you tell us about the project?
3. Are there regional preferences in types of environmental certifications?
    a. If yes: what are the preferences in each region?
4. What are the advantages and disadvantages to an environmental certification?
5. What factors do you think are most important in an environmental certification?

Appendix C: Interview Questions for Certification/Verification Bodies

We are a group of students from WPI in Massachusetts. We are conducting interviews with members of organizations involved in the environmental certification process. Our ultimate goal is to determine the how Costa Rica can better implement certifications, and your insights will be extremely useful.

Your participation in this interview is completely voluntary and you may withdraw at any time. If you would like, we would be happy to include your comments as anonymous, though it would be useful for readers to understand who is providing the answers..

If interested, a copy of our results can be provided at the conclusion of the study. Your participation is greatly appreciated.

1. What is your role in the company?
2. What is your background in environmental certifications, and what kind of work have you done with them?
3. In which countries do you certify companies/verify certification bodies?
4. Generally, do type 1 certifications or type 3 certifications cost more?
5. Around how long does it normally take to receive a certification?
6. What are the advantages and disadvantages of an environmental certification?
7. What are the main obstacles you see with companies that pursue certifications?
8. Which certifications are currently trending?
9. Can you tell us how to receive more information on specific certifications?
10. What do you think is important in a certification?
11. What should companies know to make the process of obtaining a certification easier?

Appendix D: Interview Questions for Expert

We are a group of students from WPI in Massachusetts. We are conducting interviews with experts on the subject of environmental certifications. Our ultimate goal is to determine the how Costa Rica can better implement certifications, and your insights will be extremely useful.

Your participation in this interview is completely voluntary and you may withdraw at any time. If you would like, we would be happy to include your comments as anonymous, though it would be useful for readers to understand who is providing the answers..

If interested, a copy of our results can be provided at the conclusion of the study. Your participation is greatly appreciated.

1. What is your role at [company]?
2. What are your main doubts and concerns with environmental certifications?
3. Why do you think environmental certifications are not common in Costa Rica?
4. Do you think a government marketing campaign would help to raise consumer awareness or go ignored?
5. Do you think government incentives would be effective in helping to raise the rate of certification in Costa Rica?
6. What are the implications for companies that can't afford high quality certifications?
7. Do you know how to get more accurate information about specific certifications?
    a. Which are available in Costa Rica?
8. What do you think is most important for companies to consider when comparing certifications?

Appendix E: Comparison Charts

Agricultural Certifications

Certification	USDA Organic	Fair Trade USA	Bio-Siegel	Bird-Friendly Coffee	QCS Organic
Eco-Label					
Standards	prohibit organically processed foods from containing artificial preservatives, colors, or flavors	farmers, workers, consumers, industry and the earth.	At least 95% of agricultural ingredients in a product must be organiC	minimum of 40 percent shade coverage	NO INFO
Applies to Multiple Industries	YES	YES	YES	NO	YES
Credibility	HIGH	HIGH	HIGH	HIGH	HIGH
Recognition	HIGH	HIGH	AVERAGE	AVERAGE	LOW
Cost	LOW*	NO INFO	HIGH	NO INFO	LOW
ROI	VARIES BY PRODUCT	VARIES BY PRODUCT	VARIES BY PRODUCT	VARIES BY PRODUCT	VARIES BY PRODUCT
Specificity	HIGH	HIGH	HIGH	AVERAGE	NO INFO

Building Certifications

Certification	RESET (Requisitos para edificios sostenibles en el tropico)	LEED (Leadership in Energy and Environmental Design)	BREEAM (Building Research Establishment Environmental Assessment Method)
Eco-Label			
Standards	*socioeconomic factors, transport, spacial quality, floors and landscape, materials, water efficiency, energy optimization*	*integration process, location and transportation, sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation, regional priority*	*energy efficiency, carbon output, design durability, ecological value*
Applicability to Tropical Areas	**HIGH**	**LOW**	**LOW**
Recognition	**LOW**	**HIGH**	**AVERAGE**
Credibility	**HIGH**	**HIGH**	**HIGH**
ROI	**HIGH**	**HIGH**	**HIGH**
Cost*	**LOW ($500+/m2)**	**HIGH ($2000-4000/m2))**	**NO INFO**
Specificity	**HIGH**	**LOW**	**HIGH**

Carbon Neutral Certifications

CERTIFICATION	Carbon Clear	Carbon Neutral Company	Carbon Trust	CarboNZero	Carbon Free Certification	Carbon Neutral
ECO-LABEL						
CREDIBILTY	HIGH	HIGH	HIGH	AVERAGE	AVERAGE	LOW
SPECIFICITY	HIGH	LOW	LOW	HIGH	LOW	LOW
COST	LOW	HIGH	LOW	HIGH	AVERAGE	AVERAGE
ROI	HIGH	HIGH	HIGH	HIGH	HIGH	HIGH

Carbon Product Certifications

CERTIFICATION	Carbon Free Certified	Verified Carbon Standard	Carbon Footprint of Products	Carbon Trust	Green Tick
ECO-LABEL					
CREDIBILITY	HIGH	HIGH	HIGH	AVERAGE	AVERAGE
RECOGNITION	AVERAGE	AVERAGE	LOW	HIGH	LOW
COST	HIGH	AVERAGE	AVERAGE	HIGH	HIGH
ROI	HIGH	AVERAGE	NO INFO	HIGH	AVERAGE
SPECIFICITY	HIGH	LOW	HIGH	HIGH	HIGH

Energy Certifications

CERTIFICATION	Energy Star	Wind Made	80 Plus	EnerGuide
LOGO				
CREDIBILITY	HIGH	HIGH	LOW	HIGH
RECOGNITION	HIGH	AVERAGE	AVERAGE	NO INFO
COST	AVERAGE	AVERAGE	LOW	NO INFO
ROI	HIGH	NO INFO	HIGH	NO INFO
SPECIFICITY	HIGH	HIGH	LOW	NO INFO

Life Cycle Analysis Certifications

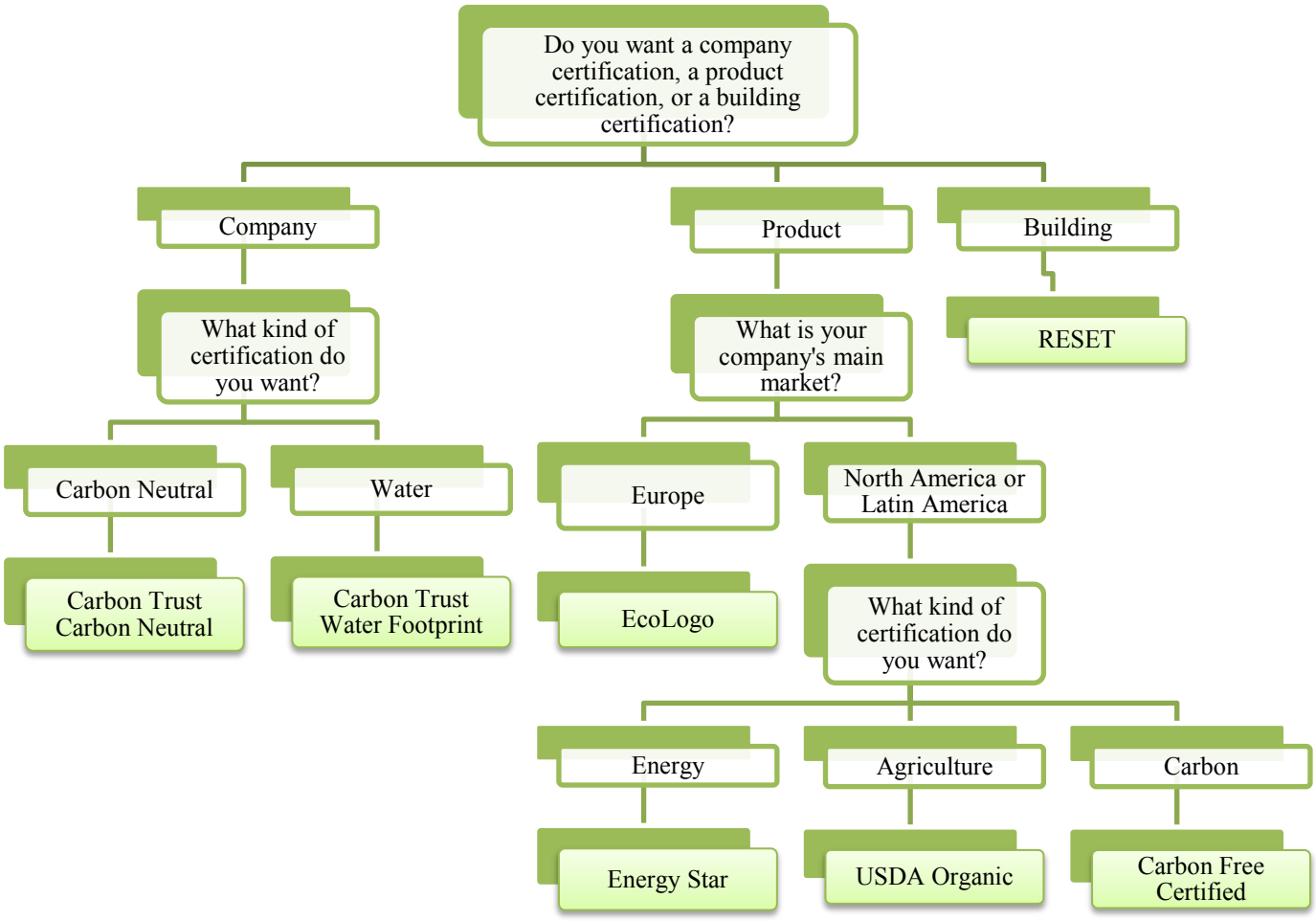
CERTIFICATION	EcoLogo	EPEAT (energy products)	Milieukeur	TCO Certified	LEAF Marque	Sustainable Agriculture Network	4C Association
ECO-LABEL							
STANDARDS	multi-attribute, life cycle-based sustainability standards	Electronic products: design, production, energy use and recycling	energy, water, GHG emissions, packaging and waste, materials	Electronic Products: social responsibility, climate, health, safety, emissions, lifetime, materials, packaging	NO INFO	Farms: pesticide, social responsibility, etc	NO INFO
APPLIES TO MULTIPLE IN	YES	NO	YES	NO	YES	NO	NO
CREDIBILITY	AVERAGE	HIGH	HIGH	HIGH	HIGH	AVERAGE	AVERAGE
RECOGNITION	HIGH	AVERAGE	HIGH	AVERAGE	AVERAGE	HIGH	HIGH
ROI	NO INFO	LOW*	HIGH	NO INFO	LOW	NO INFO	HIGH
COST	NO INFO	HIGH	NO INFO	NO INFO	HIGH	NO INFO	HIGH*
SPECIFICITY	AVERAGE	AVERAGE	AVERAGE	AVERAGE	LOW	LOW	LOW

***The low cost is based off a claim made by EPEAT, so we are not sure if it is accurate**

Water Certifications

CERTIFICATION	Carbon Trust Water Footprint	Water Sense	Processed Chlorine Free
ECO-LABEL			
AVAILABILITY TO MULTIPLE COUNTRIES	HIGH	LOW (Only to US Imports)	NO INFO
CREDIBILITY	HIGH	HIGH	HIGH
RECOGNITION	HIGH	AVERAGE	NO INFO
ROI	HIGH	NO INFO	NO INFO
COST	NO INFO	NO INFO	HIGH
SPECIFICITY	HIGH	HIGH	HIGH

Appendix F: Decision Tree



Appendix G: Data for Comparison Charts

Agriculture Certifications

Name of Certification	What the standards are	How many countries	How many companies	Recognition	Any cost info	Any ROI info	Credibility	Specificity	Does it apply to multiple industries?	Product/Farm
Fair Trade USA	Fair Trade USA enables sustainable development and community empowerment by cultivating a more equitable global trade model that benefits farmers, workers, consumers, industry and the earth. We achieve our mission by certifying and promoting Fair Trade products.	70+	1049	High	Lack of specific information; Varies on product being certified	Yes: ROI varies based on product certified (For example: $0.10 extra per pound of coffee when certified)	High (Nonprofit with third-party verification)	High (Certified in according to ISO 17065)	Yes	Product
USDA Organic	Regulations prohibit organically processed foods from containing artificial preservatives, colors, or flavors and require that their ingredients are organic, with some minor exceptions.	Many	No info	High	Varies by verifier, and product. Ranges from a few hundred to several thousand	Varies by Product	High (Third Party Verification)	High (product must have 95% organic products, no more explanation)	Yes	Product
Bio-Siegel	At least 95% of agricultural ingredients in a product must be organic. Can be use by a company in compliance with the EU regulation on food and farming. Redundant with the EU Biologo which is mandatory for organic products in Europe.	In the 30s I think (for compnaies that see in the EU, possibly only Germany)	4615 companies -> 72358 Products	Average	Free for use of label. Unknown cost of conforming to standards	No information	High (Third Party Verification)	High (product must have 95% organic products, no more explanation)	Yes	Product
Bird-Friendly Coffee	USDA Organic Standards & Require a minimum of 40 percent shade coverage and also make recommendations for the diversity and size of trees that make up the forest canopy. These standards ensure a variety of habitats that supports a wealth of wildlife.	At least 12 (Includes Central American region)	34 farms	Average	No information	Benefits of USDA Organic	High (Third-party verification)	Average (Minimum requirement to meet USDA Organic Standards)The standards require at least 40% canopy cover over the farm	No (Coffee industry only)	Farm
QCS Organic	No Information	12 countries	No Info	Low	No information	no information	High (Third Party Verification)	Low	Yes	Process

Building Certifications

Name of Certification	How many countries	How many buildings	Recognition	Any cost info	What are standards on	Credibility	Cost	ROI	Specificity
LEED	150+	More than 13.8 billion square feet of building space are LEED-certified (as of August, 2015)	most widely used green building rating system in the world	$12,250-41,250 $2000-4000/m2	integrative process, location and transportation, sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation, regional priority	High	High ($12,250-41,250), ($2,000-4,000/m2)	High	Low (standards are not very specific, wiggle room)
BREEAM	78	over 2 million	Average	less than LEED, still expensive	energy efficiency, carbon output, design durability, ecological value	High	High (slightly less than LEED)	High (recover investment in 2-5 years through savings alone)	High
RESET	Central America, China	No information	Low	$500+/m2	socioeconomic factors, transport, spacial quality, floors and landscape, materials, water efficiency, energy optimization	High	Average (Roughly $1000 for registration and certification + about $300 for every 1000 square meters that needs auditing)	High	High

Carbon Neutral Certifications

Certification	How many countries	How many companies	Recognition (based on numbers of countries and companies)	ROI info	Standards	Cost	Specificity	Credibility
Carbon Clear	No info	No info	No info	Evidence for High https://www.2degreesnetwork.com/groups/2degrees-community/resources/four-carbon-management-trends-and-examples-ftse-100-best-practice-leaders/	PAS 2060 (carbon footprint specifications, carbon management plan, offset any carbon emissions, 3rd party verified)	No info	High (PAS 2060)	3rd party
Carbon Neutral Company	35	over 350	High	No information	The Protocol incorporates best practices in the areas of measurement and monitoring of GHG emissions and the design and certification of emission reduction projects.	No info	High (PAS 2050)	3rd Party for profit - Average
Carbon Trust	United Kingdom, China, South Korea, Italy, and willing to certify in other countries	over 1000	High	Studies say it is High. For example, npower saved £740,000 in one year from energy reductions	The Carbon Trust Standard for Carbon recognises organisations that take a best practice approach to measuring and managing their greenhouse gas emissions, achieving real reductions in these year-on-year. The certification provides a framework for organisations to enhance their operational sustainability, improving energy efficiency at the same time as cutting costs.	Evidence for High http://www.ukgbc.org/sites/default/files/Pinpointing_Carbon%20Trusts%20Standard.pdf	High (uses PAS 2050 for a guideline)	3rd Party
CarboNZero	17	326	High	Evidence for High http://www.landcareresearch.co.nz/publications/innovation-stories/earlier2/carbonzero-certification-greening-our-trading-future	Measures greenhouse gas emissions and puts in place strategies to reduce these emissions. Uses ISO 14064 and PAS 2050 standards.	No specific information. Annual Audits + Annual Fee for membership	High (ISO 14064 & PAS 2050)	3rd Party
Carbon Free Certification	At least 4 including Brazil	Unknown	Average	In one case generated ROI of almost 70%	The Carbon Free® Product Certification label is aimed at increasing awareness of the carbon dioxide emissions of products and recognizing companies that are taking responsibility for their products' carbon footprint while helping to hasten a market transformation to a low - carbon future.	"varies by product"	High (Life cycle analysis of Carbon)	High (third party audit)
Carbon Neutral (INTE)	1 (Costa Rica)	39 as of the beginning of 2015	Low in the international community	Sykes: 300%	El programa establece procedimientos para otorgar la marca C-Neutral, contempla el reporte de inventarios y, con esto, el registro de la huella de carbono de las organizaciones. También integra el registro de las Unidades Costarricenses de Compensación (UCCs) y demás mecanismos de compensación, así como el registro nacional de emisiones, reducciones y compensaciones.	Nothing for the label. Cost is to change practices	High (net carbon emissions must total 0)	High (Accredited 3rd body required)

Carbon Product Certifications

Name of Certification	Logo	How many countries	How many companies	Recognition	Any cost info	What the standards are	Any ROI info	Credibility	Specificity
Carbon Trust Product Footprint Certification		20 (for companies that export to England)	>25000 products (a different source has over 2000 which I find more believable)	high	High	https://www.carbontrust.com/media/602844/carbon-trust-certification-overview.pdf	47 Metric tons of carbon saved ~ 4.5 billion British pounds in energy cost across 650 organizations and 27000 products ~ 7 million British pounds per organization but that assumes same size for all companies	Average: Third Party verification, for-profit publisher	High (Adherence to PAS 2050 standards)
Carbon Free Certified		At least 4 including Brazil	unknown	average	"varies by product"	https://www.carbonfund.org/images/CF_Product_Cert_2015.pdf	In one case generated ROI of almost 70%	High (third party audit)	High (Life cycle analysis of Carbon)
Green Tick		3+	unknown	Low	**high** $2943 + Auditing expenses + 692.47 per additional site + 173.12 per additional product + Application preparation fee + .5% sales in USD	http://sustainablesue.wix.com/greentick#!standards-costs/cf7k	~ **26% with a 3-4 month break even point** http://www.freshfruitportal.com/news/2013/12/20/opinion-sustainable-water-supplies-mean-life-or-death-for-fruit-industry/	Average (Accredited Third Party but For Profit)	High (above and beyond ISO 14064)
Carbon Footprint of Products		Only Japan?	3	Low	**Average** 2370.80 + Variable cost based on sales http://www.cfp-japan.jp/english/rules/pdf/R-14-06.pdf	http://www.cfp-japan.jp/english/overview/index.html	None	High (third party audit)	High (Conforms to ISO 14040 and 14044)
Verified Carbon Standard		11	>1000 projects	Average	Price varies with the number of carbon credits required and the price of those credits usually $4-6 dollars per credit	http://www.v-c-s.org/how-it-works/why-vcs	I'm going to say **Average** From a project done by Duke University: The City of Durham program lies in the middle of the range of return on investment indicators	High (third party audit)	Low (Not aligned with an ISO. Further research required)

Energy Certifications

Name of Certification	How many countries	How many companies	Recognition	Any cost info	What the standards are	Any ROI info	Credibility	Specificity	Wide-scale Application
Energy Star	7+	16000 partners	High	Cost depends on auditor	Promote high efficiency office equipment Reduce GHG emissions; Increase energy efficiency;	High	High (Government-operated and third-party verified)	Average	High
Wind Made	12	51	Average	Costs depend on auditor	A minimum of 25% of a company's electricity consumption must come from wind energy to get WindMade certified.	No information	High (Non-profit with third-party audits)	Average	Average (Only for companies)
80 Plus	No Information	100+ (Including Dell and HP)	Average	yearly operating cost: $100-1000	The 80 PLUS® performance specification requires power supplies in computers and servers to be 80% or greater energy efficient at 10, 20, 50 and 100% of rated load with a true power factor of 0.9 or greater.	Pay initial cost within 1 - 2 years	Low (For-profit)	Average	Low (Only for computer and server power supplies)
EnerGuide	Canada	No information	Not enough information	No information	Must meet a certain level of energy efficiency	No information	High (Government)	High	Not enough information

Life Cycle Analysis Certifications

Name of Certification	Logo	How many countries	How many companies	Recognition	Any cost info	What the standards are	Any ROI info	Credibility	Specificity
EPEAT (energy products)		42	More than 50	High (in over 42 countries)	Low*	The EPEAT system combines strict, comprehensive criteria for design, production, energy use and recycling with ongoing independent verification of manufacturer claims.	High* (Access to more procurement contracts)	High (Random third-party inspections performed)	Average
EcoLogo		104 (Not specifically stationed in Costa Rica, but has stations in Latin America)	No company info, but over 96,000 product evaluations	High	No	"UL is the exclusive provider of GREENGUARD Certification for products that meet stringent chemical emissions requirements, and ECOLOGO Certification for products that meet multi-attribute, life cycle-based sustainability standards. We also offer single-attribute environmental claims validations, waste to landfill validation, Environmental Product Declarations and organizational sustainability certifications"	No	Above Average (Third-party verification, but company is for-profit)	Average
Milieukeur (many types of products)		6	185 (As of December 2015)	High	http://www.milieukeur.com/282/for-producers/milieukeur-fees.html	Non-Food: Energy and water use; Greenhouse gas emissions; Harmful substances; Fine particles; Packaging and waste; Raw materials; Working conditions Food: Animal feeds;Animal welfare; Biodiversity; Crop protection; Minerals/fertilisers; Nature and countryside	No	High (Regularly scheduled third-party inspections)	Average
TCO Certified		No info	Over 900 certified product models from 30 brands (April 2016)	Average	No	http://tcodevelopment.com/tco-certified/criteria-in-tco-certified/	No	High (Third-party associations accredited according to ISO/IEC 17025)	Average (8 different types of categories for different electronics)
LEAF Marque		No info	No info	Average	Cost from £225+	http://www.leafuk.org/leaf/farmers/LEAFmarquecertification/standard.eb	Average savings of £14,000	High (Third-party with inspections throughout the year; certification bodies are accredited)	Low (Applies to a broad range of food products)
Sustainable Agriculture Network		More than 40	Not company-specific, but more than 1,800 certifications	High	No	http://san.ag/web/our-standard/types-of-standards-and-policies/	No	Above Average (Third-party verification; but SAN is linked to the accreditation process)	Low (Applies to farms; not specific products)
4C Association		No specific count, but participants in the Americas, Africa, Asia, Europe, and Australia	280 farms; 300,000 farmers and 900,000 workers are working under 4C certifications	High	Approximately € 2,800	http://www.4c-coffeeassociation.org/resources/assessment-tool	Sustainability can lead to reduced costs for farms*	Above Average (Third-party, but audits only conducted once every three years with random audits included)	High (Only applies to coffee farms)
*Claim by the company									

Water Certifications

Name of Certification	Logo	How many countries	How many companies	Recognition	Any cost info	What the standards are	Any ROI info	Credibility	Specificity
WaterSense (Only available if exporting to United States)		Mostly in United States, but has potential to get certified in other countries (has an accredited internal certification body)	Over 1,613 partners as of 2014	High	Determined by certifying body	Perform as well or better than their less efficient counterparts; Are 20 percent more water efficient than average products in that category; Realize water savings on a national level; Provide measurable water savings results; Achieve water efficiency through several technology options; Are effectively differentiated by the WaterSense label; Obtain independent, third-party certification.	No information	High (US Government certification; Requires Third-party verification)	High
Carbon Trust Water Footprint Certification		At least 2	At least 10 (Including major companies like Coca Cola Enterprises)	High (Carbon Trust: Water was made in 2013, but Carbon Trust has older well-known certifications)	No information	The Carbon Trust Standard for Water recognises organisations that take a best practice approach to measuring and managing their water use, achieving real reductions in this year-on-year. The certification provides a framework for organisations to enhance their operational sustainability, using water more efficiency and improving stewardship at the same time as cutting costs.	Apparantly high water savings, which could result in ROI from efficient alone.	High	High (Accredited to ISO and PAS Standards)
Processed Chlorine Free	CARBON TRUST STANDARD REDUCING WATER YEAR ON YEAR	No information	No information	No information	$2,500 + travel expenses for on-site audit; $3,500 + travel expenses for annual audit;	Focus is promoting sustainable manufacturing practices, implementing advanced technologies free of chlorine chemistry	No information	High (Non-profit; Uses Third-party verification)	High