

What's an ecolodge?

- a case study of ecotourism operations in Ecuador



Sunrise over the Amazon rainforest by Napo Wildlife Center. Private photo.

A master thesis in environmental science, 30 ECTS
and a Minor Field Study supported by Sida
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June 7, 2011

Executive summary

The tourism sector is today the largest business sector in the world, employing over 230 million people. It has been growing incessantly the last decades and shows no tendencies to slow down. Tourism can bring strong economic support to a developing country, but has also been pointed out as a major contributor to climate change as well as environmental degradation and pollution. A shift toward a more sustainable development of global tourism is therefore essential.

Ecotourism is a type of tourism that was first described in the 1970s, and has developed exponentially since then. A literature review paints an image of ecotourism as focusing on natural environments and aiming to be environmentally, socially and economically sustainable. Within ecotourism fits the more delimited ecolodge, which, according to the literature, offers accommodation and educative activities in a way that supports the local community and environment. Ecolodges thereby have the potential to push for increasing sustainability in the entire tourism sector since they can increase tourists' awareness of sustainability issues, which will hopefully shift tourists' demand toward more sustainable alternatives. However, research on these businesses is rare and no official definition was found in literature. Without an official definition and principles, the credibility of true ecolodges is at risk and the name can easily be misused.

To find out what an ecolodge is in practice and how an ecolodge definition could be formulated, seven tourism lodges in Ecuador were chosen as case studies. Based on the literature review, five indicators of environmental sustainability and four indicators of socioeconomic sustainability were chosen as tools to measure the seven case studies. The environmental indicators – construction, water, energy, food and waste – showed to be less prioritized in practice by the case studies, although the literature emphasized the environmental sensitivity of a theoretic ecolodge. The socioeconomic indicators – staff, local community, tourist education and certification – were stronger at the case studies, signaling that an ecolodge, according to theory and practice strives to be both environmentally and socioeconomically sustainable.

The literature review and the visits to the seven case studies showed that the nine chosen indicators of sustainability were fitting as ecolodge measures, together with nature conservation. In order to support the continued spreading and awareness of ecolodges worldwide, this thesis concludes with a suggestion for an official ecolodge definition followed by accompanying principles on environmental sensitivity and nature conservation, close connection with the local community and extensive sustainability education for staff, local inhabitants and visitors. A tourism operation would have to live up to both the definition and the principles in order to legitimately be called an ecolodge. The suggested definition is as follows:

An ecolodge strives for environmental, social and economic sustainability through tourism in or near a natural area, which conserves the local environment and supports the local communities long-term, socially and economically, and actively fosters environmental and cultural understanding, appreciation and awareness, both among its visitors as well as among the staff and local inhabitants.

The hope is that this thesis will inspire to criteria being created for each principle for a more detailed ecolodge description; that this description will be made official and spread globally; and that this will eventually result in an international certification for ecolodges. An international certification that can be adapted to the local environmental and climatological circumstances for each potential ecolodge could strengthen each operation's credibility and market competition, increase the general awareness of tourism's impact – positive as well as negative – on this planet, and inspire to a shift in demand toward more sustainable tourism alternatives, which thereby ultimately might influence the entire tourism sector.

Acknowledgements

This thesis would not have been completed without the endless, constructive and loving support of several people, of which some are mentioned here.

Firstly, my deepest thank you to Julieta Muñoz and her family who took me in as one of their own for an extended amount of time in their home in Quito. The entire family greeted me with love and respect and I do not think I realized how well I was being cared for in time to thank you in person. I do hope I get to see you all again soon in your amazingly beautiful country.

Secondly, a proud thank you to my supervisor Mikael Backman at the International Institute of Industrial Environmental Economics (IIIEE) for accompanying me from start to finish; to Håkan Wallander who helped me develop my research plan and set me in contact with Rene Torres in Ecuador; to Rene for strongly facilitating my visits to the case studies; to the Swedish International Development Cooperation Agency which provided the scholarship that enabled me to go; and to all the managers and wonderful staff at the Ecuadorian lodges that accepted being a part of this thesis, and helped me in every way possible.

Thank you Rasmus for supporting me in applying for the scholarship; to actually go once I received it; and keeping my spirit up during the entire stay. I wish you the same support in whatever you dream of doing.

Lastly, but most importantly, my mom. I would not be anywhere or anything without you. Thank you for never losing faith in me and for supporting me all the way.

My sincere and warm thank you to all of you...

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1. Introduction

1.1 Background

The history of tourism spans over thousands of years. Travel and tourism have grown since and have today become the largest business sector in the global economy, providing more than 230 million jobs worldwide (TIES, 2006). The immense industry is very complex with several different kinds of tourism and tourists, and includes stakeholders of sizes ranging from multinational chains to small, family-run businesses.

According to the United Nations' World Tourism Organization (UNWTO), international tourist arrivals have increased globally from 528 million individuals in 1995 to 935 million in 2010 (UNWTO, 2011), an increase by 77 % in only 15 years. The forecast for 2020 is 1.6 billion (UNWTO, 2008), another 71 % up from 2010. These figures indicate that this business sector is immense, has grown fast and will continue to grow rapidly the coming decade.

With a business sector of this size – and increasing – it is not difficult to imagine the corresponding range of its impacts, positive as well as negative.

Becken & Patterson (2006) declare tourism as a “major contributor to climate change” as well as resource consumption and environmental impact. The United Nations Environment Programme (UNEP) states that the three main areas of impact caused by the tourism industry are depletion of natural resources, pollution, and physical impact (UNEP, 2010).

These main impact areas concern environmental sustainability, but also indirectly social and economic sustainability, considering how water shortage, aesthetic pollution, littering, deforestation, land degradation, etc. affect the lives of local inhabitants and the local, national, and even global, economy. Further, Patterson et al. (2006) emphasize that climate change and tourism are interlinked since they influence each other and “are intrinsically global, are tightly linked to resource pressures, and require governance at levels which range from the local to the global”.

Angel Gurría, Secretary General of the OECD, explains in the Living Planet Report 2010 by WWF that the biosphere is under large pressure due to the current global economic

system and that “business as usual” is not an alternative.

On the other hand, tourism can offer strong economic support to a developing country. The International Ecotourism Society (TIES) claims that tourism today is one of the main sources of foreign exchange to 83 % of the world's developing countries, and the main source of foreign exchange to one third of the poorest countries (TIES, 2006).

In order to combine the positive economic aspects of tourism with mitigation of the industry's negative environmental and social impacts, it is necessary to support sustainable development of tourism. Hence, environmental, social and economic aspects all need to be scrutinized for an all-embracing apprehension of the industry's sustainable development (Becken & Patterson, 2006).

Additionally, the average tourist comes from an industrialized country, which are the main contributors to climate change, and visits a developing country, which are the ones most struck by its consequences (Patterson et al., 2006). This means that a shift toward improved sustainability within the tourism sector is highly called for.

An example of already spreading sustainable development within the tourism sector is the existence of ecotourism. The ecotourism sector has grown annually by 20-34 % since the early 1990s. According to a survey conducted in 2002, 70 % of British, Australian and US tourists indicated willingness to pay more for accommodation with a “responsible environmental attitude”. (TIES, 2006)

However, there is a risk of opportunistic operators taking advantage of the appealing ecotourism business in order to profit on activities that are actually unsustainable (Stern et al., 2003).

Considering man's long history of tourism, it is unlikely that it would be possible to hinder people from travelling, which is why it is essential for the vast business sector to choose a sustainable path ahead. Properly sustainable development of tourism may decrease the sector's vast footprint in general, and in particular mean a growing advantage for serious, individual businesses in the competition for the increasing number of environmentally and socially aware customers.

1.2 Problem definition

The relatively recent appearance of lodges adding the prefix “eco” is connected to the successful development of ecotourism, but research on these businesses is rare (Osland & Mackoy, 2004). Further, the ecolodge concept is today not fully established, likely due to the still debated concept of ecotourism, the lack of research on ecolodges, their relatively recent occurrence, etc. The prefix “eco” and the ecolodges’ connection to ecotourism imply environmental awareness and sustainability efforts, but as long as the ecolodge concept is undefined and unofficial the risk of confusion and misuse looms large. If there is no official definition and no ways of confirming the quality of the sustainability of tourism businesses that call themselves ecolodges, an ecolodge concept has no credibility and the competition for truly sustainable tourism lodges is undermined.

1.3 Thesis purpose

The purpose of this thesis is to find out what an ecolodge is, both in theory according to literature, and in practice based on the operation of seven Ecuadorian case studies. The question if ecolodges may add sustainable development to the tourism sector will be investigated.

An ecolodge concept with suggestions for principles based on the case studies will also be presented. The intention is that this concept with principles will be developed further and become applicable to ecolodges worldwide, at least for lodges situated in the same kind of climate as in any of the four climate zones visited.

1.4 Research questions

In order to fulfill the purpose of this thesis, the following research questions will be addressed:

- How is an ecolodge defined by literature?
- How do the seven case studies operate in practice, and do they fit the theoretic image?
- What should an ecolodge concept involve?
- Are ecolodges sustainable and would they add sustainability to the tourism sector?

- Which should the next steps be to ensure sustainable development of ecolodges?

1.5 Research methodology

1.5.1 Research Strategy

Initially, a literature review was made and online information was gathered and analyzed in order to form a theoretical image of the current ecolodge. Consecutively, seven ecolodges in Ecuador were used as case studies to find out how ecolodges work in practice. This was done through interviews with managers and staff at each ecolodge, and observations of staff on duty and guests. The findings from the two research areas (literature and case studies) were then compared and analyzed, and suggestions for improvements were worked out both for each specific ecolodge and for ecolodges in general.

1.5.2 Research Design

For the literature review, articles and other useful information were gathered through the electronic library catalogs of Lund University, the Lund University libraries, Google Scholar, and the homepages of major organizations such as TIES, UNEP and UNWTO.

Semi-structured open interviews with the ecolodge managers and staff were conducted at each ecolodge, in order to provide a deeper insight into the management, philosophy and history of each lodge. All interviews were given at each ecolodge respectively, unless noted otherwise, and all during October 2008 to February 2009. The same basic questions were asked at each site, but different answers lead to different follow-up questions. The main areas of interest were the lodge’s history, its economy and staff, connections to nearest community, possible tourist education and certifications, and the management of construction, waste, water, energy and food. The opening basic questions for each lodge are shown in appendix A. Written notes were taken during the interviews. The interviews were not recorded.

Table 1. Table of the seven Ecuadorian case studies grouped by geographical region and order of visit from left to right. For an approximate geographical location of each lodge, see map 1 in chapter 3.

Amazon	Coast	Cloud forest	Andes
Sani Lodge	Hostería Alándaluz	Maquipucuna Lodge	Polylepis Lodge
Napo Wildlife Center	-	Bellavista Cloud Forest Lodge	Black Sheep Inn

1.5.3 Selection of case studies

Ecuador became the country of this study due to its eligibility for the Sida grant called Minor Field Study (MFS) and to the available contact, Rene Torres. Torres has worked as a nature guide at several lodges in Ecuador, and, with his help, a sample of businesses agreed to take part in this study. These are located in four different, major climate zones of Ecuador; the Amazonian rainforest, the Andean highlands, the coast and the cloud forest (see table 1). Due to the variation of climates in these regions, the lodges visited face varying conditions for their operation and management and therefore need different approaches for reaching sustainability.

This spectrum of challenges and solutions provides a broader perspective to the final recommendations, and is necessary for an ecolodge concept to be applicable globally.

The ones that accepted being part of this project are Sani Lodge and Napo Wildlife Center in the Amazonian rainforest, Hosteria Alándaluz on the Pacific coast, Maquipucuna Lodge and Bellavista Cloud Forest Lodge in the cloud forest, and Polylepis Lodge and Black Sheep Inn in the Andean highlands. In table 1 above, the lodges are arranged by geographical region and in order of visit from left to right. Chapter 3 provides a map of Ecuador with the rough location of each case study, numbered according to the order of when they were visited. Contact and interview information for each lodge is provided in appendix B.

Although none of these lodges actually bear the name “ecolodge”, their operation, policies and/or ambition make them interesting for this thesis.

1.5.4 Data collection

Data about each case study were gathered through interviews with managers, staff and visitors at each lodge and in some cases the

lodges’ homepage. This covers the quantitative aspects, such as amount and kind of energy used, amount of produced waste, treatment of waste water, food management, and so on, as well as the qualitative information, such as history of the lodge and to get a sense of values and views on staff and community cooperation.

To get an overview and be able to easily compare the ecolodges to one another, all the gathered data have been arranged in a table attached as appendix C, and as a smaller table with rating of each sustainability indicator in the end of chapter 3.

1.6 Limitations

Only seven lodges were visited and in only one country, due to limited time and budget. The data gathered are therefore not sufficient enough for statistical conclusions. However, general ideas of an ecolodge operation were formulated based on the examples and perspectives that the visits to the seven lodges provided. The reader should however bare in mind the modest number of case studies.

The major focus was set on the selected nine quantitative and qualitative indicators of the ecolodges’ environmental, social and economic sustainability, such as impacts on and adaptation to the natural surroundings and local community. The selected nine indicators are considered to be the major factors influencing the sustainability, though the sustainability of an ecolodge includes more than these nine indicators. For example, Becken & Patterson (2006) point out that to assess the environmental impact of tourism, not only the accommodation and recreational activities should be involved but also transport services for both people and goods. For a more correct assessment of an ecolodge’s sustainability, the emissions and environmental impacts of the tourists’ transportation to and from the lodges should be

included (especially international flights), but the time and budget frames of this study did not allow for such analysis. However, it can be mentioned that most of the guests at the case studies were visitors from outside South America.

Due to cultural and language barriers, some information might have been lost in translation.

1.7 Thesis outline

Initially, the background and research details of the thesis are described in the introductory first chapter.

Chapter 2 is theoretic and describes the conceptual and analytical frameworks of this thesis based on a literature review. The conceptual framework discusses definitions of relevant types of tourism and narrows down to the ecolodge idea. The analytical framework describes the indicators of environmental, social and economic sustainability, and why they were chosen as tools to measure the case studies.

Chapter 3 describes the case studies, beginning with an overview of the geography, history and economy of Ecuador. This section aims at providing an appreciation of the physical, social and economic circumstances for

the case studies in this specific country. Following the history and geography of each ecolodge in section 3.2, the case studies are described based on the environmental, social and economic sustainability indicators chosen in chapter 2.

Following, chapter 4 contains an analysis and discussion on how the case studies compare with the theoretic image of an ecolodge and to each other, and what role they play in providing sustainability to the tourism industry.

Finally, chapter 5 offers a summary and conclusions, where a definition of the ecolodge concept is formulated together with suggestions for ecolodge principles.

Appendices are attached in alphabetical order after chapter 5 and the reference list. Appendix A provides the opening questions for the semi-structured interviews at each case study; appendix B lists interview and contact information for each lodge; appendix C contains a table for facilitated overview and comparison of the case studies and their businesses; appendix D lists the main 13 principles of the Smart Voyager certification, which is mentioned in section 2.3 and discussed further in chapter 4; and appendix E contains the reference of an online discussion with lodge manager Andres Hammerman cited in chapter 4.

2. Thesis Frameworks

2.1 Conceptual framework

2.1.1 Tourism definitions

A genre of tourism that has grown immensely since the 1970s is tourism close and related to nature. More and more people seek alternatives to mass tourism and wish to spend their holidays surrounded by pristine nature and undisturbed wildlife. Simultaneously, this kind of tourism may provide an income source for people in developing countries and may help to conserve local ecosystems, as opposed to invasive mass tourism, spreading agriculture, and logging. This is why types such as sustainable tourism, nature-based tourism and ecotourism have evolved (Blamey, 2001).

To understand these tourism concepts better, it is vital to begin with the definition of sustainable development. It was set in 1987 with the publication of the report made by the World Commission on the Environment and Development (WCED), commonly known as the Brundtland Commission. It says “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987).

This definition is not very specific, for example regarding the meaning of “needs” and “future”, but is the most known and used for describing sustainable development. Hence, sustainable tourism could be defined as “tourism that meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future” (TIES, 2006). This could involve protecting natural areas if that is what the tourists visit the host region for. However, the meanings of “needs of present tourists” and future “opportunities” are as diverse as they are liable to change.

Nature-based tourism is defined by TIES (2006) as “any form of tourism that relies primarily on the natural environment for its attractions or settings.” This broad definition means that a hike in a park can be classified as nature-based tourism, while, to be eligible as sustainable tourism, there could for example be a limited number of hikers per day on the trails and restricted access for cars to the park.

Ecotourism seems to first have been used as a concept around 1965 when Hetzer identified four main principles of responsible tourism;

“minimizing environmental impacts, respecting host cultures, maximizing the benefits to local people, and maximizing tourist satisfaction” (Blamey, 2001). Of these four, “minimizing environmental impacts” was the most characterizing of then-called “ecological tourism” (Blamey, 2001), indicating that ecotourism would mainly involve safeguarding natural areas. However, it could be argued that ecotourism today involves more or less all four principles, assuming “minimizing” and “maximizing” have a sustainable, long-term meaning as opposed to an economically short-term sense.

In 1987, Ceballos-Lascuráin stated one of the initial formal definitions of ecotourism, saying that ecotourism is “travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas” (Blamey, 2001). This definition paints an image of an ecotourist being a passive observer of local nature and culture, excluding active participation and exchange of knowledge and culture between the tourists and the local inhabitants. Neither does the definition appear to demand active sustainability efforts by the ecotourism business.

TIES sets a third definition of ecotourism in 1990, as “responsible travel to natural areas that conserves the environment and improves the well-being of local people” (TIES, 2006). This version requests active measures to safeguard the local natural environment over time as well as promotes support to and continuous development of the local communities. However, what role the tourists have or what kind of activities they can do is not described in more detail than abstractly “responsible”. Neither does this definition include economic sustainability of the ecotourism operation.

The connection between sustainable tourism and ecotourism is defined in the Mohonk Agreement (2000); a proposal for an international certification program for sustainable tourism and ecotourism. It was unanimously adopted in November 2000 by the 20 attending countries representing many of the leading global, regional and national sustainable tourism and ecotourism certification programs of that time. The agreement defines ecotourism

as “sustainable tourism with a natural area focus, which benefits the environment and communities visited, and fosters environmental and cultural understanding, appreciation, and awareness”. This definition is similar to TIES's version, but adds the social value of education and knowledge exchange through the importance of fostering “understanding, appreciation and awareness” of environment and culture for both local inhabitants and tourists. By educating local inhabitants, tourists and staff, the taught mentality can have widespread effects both locally when applied by the inhabitants and staff and internationally by the visitors in their everyday lives around the world.

It is easy to think that an ecotourism business would be relatively small since it should then be more likely to be sustainable. However, it should be possible for a larger operation to be sustainable as well, though large-scale ecotourism might appear to some as “an oxymoron or a betrayal of principle” (Weaver, 2001).

As shown above, there is no single official definition of ecotourism, but the ones that are used most frequently have a common theme of nature conservation and cooperation with the local communities, and in some cases knowledge exchange between visitors and local inhabitants or education in the field of sustainable development.

2.1.2 Ec lodge definitions

The number of ecolodges worldwide seems to have increased rapidly the last decade, but a stated and commonly used definition is difficult to find.

Osland & Mackoy (2004) describe ecolodges as “the accommodation facilities and services established in, or very near, natural areas visited by ecotourists.” This broad definition, that could include a Hilton hotel next to Central Park, narrows down considerably by further describing ecolodges as “a critical component of ecotourism since their design and operation influence the natural environment, their employment practices and purchases affect the local community, and the ways they serve their guests have an impact on the education and satisfaction of ecotourists.” This definition brings up good examples of environmental, social and economic sustainability and points out how intricately the ecolodge is connected to its surroundings and to ecotourism.

Osland and Mackoy also mention the definition made by Russell et al. in 1995 (cited in Osland & Mackoy, 2004), which says that an ecolodge should be “nature-dependent” and share “the philosophy and principles of ecotourism”. Russell et al. (ibid.) thereby confirm that the ecolodge fits into the ecotourism genre and is therefore also connected to sustainable development.

Further, Russell et al. (ibid.) single out design, food and activities as the three main factors that differentiate an ecolodge from a conventional resort. The design should be “integrated with the natural environment versus developed as an enclave”, the food should be “good-and-hearty versus gourmet”, and the activities should be based on nature education as opposed to being “relaxation and facility-based”. These factors show an ambition to educate the visitors about and have the lodge blend in with the local environment, rather than trying to adapt the local environment to the lodge: making the surroundings the main attraction, not the lodge. Differences in perspective, among many things, become obvious when comparing these thoughts with the ideas behind places like Disney World or gated luxury resorts.

In the introductory chapter of “The ecolodge sourcebook for planners and developers” (Hawkins et al., 1995), the definition by Russell et al. is also used, but expanded with the words of Bottrill and Pearce (cited in Hawkins et al., 1995). These add an expectation of an educational and participatory experience for the tourist, that the lodge is developed and managed in an environmentally sensitive manner, and that it protects the environment it is operating in. Pointed out by the authors of the chapter, “it is the philosophy of ecological sensitivity that must underlie, and ultimately define, each operation”. Emphasis is thereby put on environmental sustainability factors and the importance of educating and engaging the tourists. However, the description leaves out any responsibility to support any local social and economic sustainable development.

As shown above, there are many versions of what an ecolodge is, but much fewer can be found in the literature than versions of ecotourism definitions. The ecolodge definitions all share similarities, but differ remarkably in scope and depth of sustainable development.

To summarize, an ecolodge is described according to literature as an accommodation facility visited by ecotourists, and as being

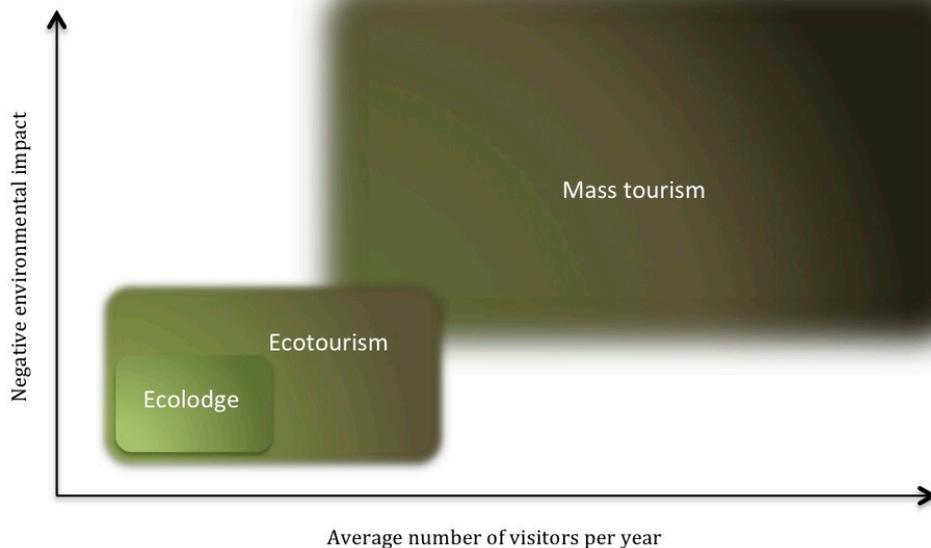


Figure 1. The relative relation between ecolodge, ecotourism and mass tourism regarding scope of negative environmental impact and amount of tourists involved on average per year, as understood by the literature review.

connected to the philosophy of ecotourism. The largest emphasis is on the ecolodge blending in with its natural surroundings and managing nature sustainably. But aspects such as responsible management of staff are also mentioned, as well as tourist education and respect for the local community. This shows that an ecolodge, according to literature, should strive for environmental, social and economic sustainability.

Figure 1 shows an attempt to visualize the appreciated relation between the ecolodge, general ecotourism and mass tourism, regarding amounts of tourists per year and scope of negative environmental impact. As understood by the literature, an ecolodge would not overlap with the definition of mass tourism, while ecotourism, according to some definitions, could have similarities with mass tourism regarding the amount of tourists accepted (Honey, 2007; Weaver, 2001). However, mass tourism would stand for the vast majority of the negative environmental and socioeconomic impact.

2.1.3 The Millennium Goals

During the United Nations Millennium Summit in the year 2000, eight Millennium Development Goals (MDG) were composed. The idea of the ecolodge could have a role in trying to reach these goals and at the same time gain from being supported by the UN. This provides an example of how ecolodges can have

a part in a larger sustainability movement that stretches beyond the tourism sector.

The first MDG strives to “eradicate extreme poverty and hunger” by for example “decreasing the proportion of people whose income is less than one dollar a day”, and by “achieving full and productive employment and decent work for all, including women and young people” (MDG 1, 2000).

As an answer to this goal, the UNWTO launched the Sustainable Tourism – Eliminating Poverty program (ST-EP) in 2002 (UNWTO, 2010). By supporting sustainable development of tourism in a developing country jobs can be created, more foreign currency can be imported, and both local inhabitants and foreign tourists can obtain opportunities for culture and knowledge exchange (UNWTO, 2008). As some case studies ascertained, there are ecolodges that are owned and run by a local tribe or small community, which can ensure the locals of employment and a relatively steady income, and thereby assist in getting a little closer to this goal. Yet another case study claimed to strive for a 50/50 division between male and female employees, as well as providing education for the local inhabitants who apply for positions they were not yet educated for.

MDG number seven means to “ensure environmental sustainability” by for example integrating “the principles of sustainable development into country policies and programs and reverse the loss of environmental resources”

(MDG 7, 2000). Since one of the main attractions to ecolodge visitors seems to be the closeness to relatively undisturbed nature and wildlife it is in the interest of ecolodges to protect their surroundings and make sure plants and animals thrive in their natural habitats. Climate change, unsustainable use of natural resources, biodiversity loss, etc., affect the entire planet, which is why all ecolodges must contribute to a global decrease in man's negative impacts, not only out of solidarity to other ecolodges but also for the sake of each individual business. For example, a large association of ecolodges may have an effect on governments to ratify new sustainability laws and principles. These principles could make the business sector more stable and easier to run, and protect the environment from local damage caused by for example oil extraction and expanding agriculture. Hence, the government would be ensured of income sources through international visitors, increasing job opportunities, and national tax revenue.

2.1.4 Credibility

There is need for a general move towards sustainability practices within the entire tourism industry and ecolodges should be at the forefront. Martha Honey wrote in 2007 that "ecotourism needs to not just be conceptualized, but codified" in order for this type of tourism to have progressive effect. The same should be relevant for ecolodges, as a specified smaller section of ecotourism. Certifications with well-known demands on environmental, social and economic sustainability for ecolodge operations could have great importance to the business. However, the ocean of different green schemes, recommendations, clubs, societies, practices and policies can be more a source of confusion than guidance.¹ And, since there is no official, international certification particularly for ecolodges or control over the use of the prefix "eco", any tourism accommodation business that applies some environmentally friendly aspect and lies in or close to nature, could basically say they run an ecolodge.

There were 59 highly elaborated green certification schemes by 2001, according to a study made by the UNWTO (2002, cited in Honey, 2007), of which 68 % were focused on accommodation. However, only a few are

international while most cover one single country (Honey, 2007).

The development of certifications accelerated in 2002 after the United Nations had declared it the international year of ecotourism. Since then, several new schemes and programs have surfaced every year, for example an eco-label for environmentally and socially responsible hotels in Brazil. (Honey, 2007)

The reasons for retrieving a certification can be many; to show what makes an ecolodge different from other types of tourist accommodations and businesses, to ensure visitors of a lodge's devotion and genuineness, to provide management and staff with relevant education and goals for improvement, and so on (Honey, 2007). But if the acquired certification has no credibility, it is wasted money since neither competitors nor visitors or management itself can trust its demands to be legitimate, confirmed and updated.

National certification programs can spread quickly within the nation and be of good use by for example helping management and staff in ensuring good sustainability practices. On the other hand, not many international tourists might find out about the scheme or know what to expect from certified operators. National programs might also not be as trustworthy in countries with heavy corruption or be unaffordable for businesses owned by local inhabitants in developing countries. Therefore, though gaining some support and advice for improved operation, ecolodges can miss out in the business competition since clients are unaware of the certification's criteria and credibility.

The Ecuadorian non-profit and non-governmental organization Conservación y Desarrollo (Conservation and Development, CyD) works "to promote sustainable development and the rational use of natural resources, and to raise public consciousness about resource management", with a focus on ecotourism, agriculture and community-based projects (CyD, 2009). In 1998, CyD founded a certification program called Smart Voyager, together with the international organization Rainforest Alliance. The program was initially intended for tourism businesses in Ecuador, but has expanded to all of South America. It started off with a version for marine businesses (cruise ships and large boats) focusing on the Galápagos, but now also includes a version for land-based businesses. This thesis hereafter

¹ Some examples are ST-EP, Green Globe, Green Seal,

refers to the Smart Voyager Land program when speaking of the certification scheme.

The Smart Voyager program “endeavors to convert the concept of sustainability into something real, practical and necessary in the context of a competitive market, with an aim to improve the relationship of tourism with its surroundings” (SV, 2009). The certification program guarantees decreased negative environmental impact, direct benefits to the local population and that every tourist gets to take an active role in conservation.

The main thirteen principles of the Smart Voyager certification program are attached as appendix D. These include for example adding an environmental and social strategy to the company policy document, limiting emissions and resource use, and supporting the welfare of staff and local inhabitants. The principles are discussed further in chapter 4.

2.2 Analytical framework

So what is special about ecolodges? As described above, an ecolodge strives to be sustainable by for example adapting to, promoting and protecting its natural surroundings and local communities and economies; something a conventional accommodation business not necessarily does. And for such an immense industry, the combined effects of the tourism sector not only fire climate change, but also add to the unsustainable use of natural resources, biodiversity loss, deforestation, land degradation, pollution of water and air, etc. (Becken & Patterson, 2006; UNEP, 2010). By replacing conventional hotels with an increasing number of more sustainable ecolodges the total impact of the tourism industry can be mitigated.

For a comparative investigation of the selected case studies, nine indicators of environmental, social and economic sustainability were chosen. Social and economic indicators are described together and as socioeconomic indicators from here on since they are so tightly interlinked.

Environmental indicators:

- Construction
- Water
- Energy
- Food
- Waste

Socioeconomic indicators:

- Staff
- Local community
- Tourist education
- Certification

The choice of environmental indicators is based on the seventh Millennium Development Goal (MDG 7, 2000) and the general impression from the ecotourism and ecolodge definitions above that an ecolodge should operate in an environmentally sensitive manner (Hetzer, 1965 (cited in Blamey, 2001); TIES, 2006; Mohonk Agreement, 2000; Osland & Mackoy, 2004; Hawkins et al., 1995; Bottrill & Pearce (cited in Hawkins et al., 1995)). This should include responsible use of natural resources, and the chosen indicators involve the types considered used the most and of highest environmental impact potential: *water*, *energy*, and *waste*.

Osland & Mackoy (2004) and Russel et al. (1995, cited in Osland & Mackoy, 2004) also point out the importance of appropriate design, which together with the potential use of hazardous or long distance material make *construction* a significant environmental indicator.

The final environmental indicator is *food*, which is singled out by Russel et al. (1995, cited in Osland & Mackoy, 2004) and additionally chosen due to its essentiality to all people, constant consumption rate, and potentially high environmental impact.

The chosen socioeconomic indicators are not as outspokenly involved in the mentioned ecotourism and ecolodge definitions above, but are highly relevant for an all-embracing meaning of “sustainability”. Socioeconomic indicators considered are *staff*, *local community*, *tourist education* and *certification*. These are thought to be the social and economic factors with the largest impact and therefore of most importance.

Staff was chosen as an indicator mainly based on the first Millennium Development Goal (MDG 1, 2000) aiming to eradicate extreme poverty and provide decent work for both genders. Long-term, safe and fair employment can help alleviate local poverty and thereby indirectly improve local health and education, which underlines the importance of staff as a socioeconomic indicator.

The *local community* is closely linked to staff conditions and was chosen as a socioeconomic indicator based on the definitions saying that “local people”, “host cultures” and

“communities visited” should be respected by, involved in and benefit from the tourism operation (Hetzer, 1965 (cited in Blamey, 2001); TIES, 2006; Mohonk Agreement, 2000; Osland & Mackoy, 2004).

The importance of *tourist education* is mentioned in some sense by most of the definitions (Ceballos-Lascuráin, 1987 (cited in Blamey, 2001); Mohonk Agreement, 2000; Osland & Mackoy, 2004; Russel et al., 1995 (cited in Osland & Mackoy, 2004); Bottrill & Pearce (cited in Hawkins et al., 1995)).

The choice of *certification* as an indicator of socioeconomic sustainability relies on section 2.1.4 about credibility for ecolodges. It could also be a strong indicator of environmental sustainability since many certifications appear to be focusing on environmental aspects. However, due to the choice of retrieving a certification for

an operation’s credibility, marketing and competition potential, it was set as an indicator of the social and economic sustainability of an ecolodge.

Further, the Smart Voyager certification program focuses on sustainability integration between the tourist operation and its surrounding environment, local community, and tourists, through education (SV, 2009). Additionally, the organization Conservación y Desarrollo operates by the principle of spreading sustainable development and resource management through ecotourism and community-based projects (CyD, 2009). This supports the idea of certification as a socioeconomic indicator since it is people and money that determine to what extent sustainability is realized.

3. Description of Case Studies

3.1 Description of Ecuador

The capital of Ecuador is Quito in the northern Andes, with a population of about 1.6 million (2008). About 62 % of the Ecuadorian population lives in cities, and the average population density is 49 inhabitants/km² (2008). The Ecuadorians consist mostly of mestizos (65 %, offspring between natives and Spanish descendants) and natives (25 %). (NE, 2009 and CIA, 2009)

Life expectancy is on average 75 years, but the median age is 25 years, meaning the Ecuadorian population is quite young with 31 % aged 0-14 years. In comparison, Sweden's median age is 42 years and only 16 % are aged 0-14. Literacy is on average 91 %. National expenditures on education were only 1 % of GDP in 2001, putting Ecuador as nation number 179 of 182 in CIA's "the World Factbook". In comparison, neighboring Peru spent 2.5 % of GDP on education in 2006, Colombia 4.7 % (2006), and Sweden 7.1% (2005). (CIA, 2009)

Based on these and financial factors (see section 3.1.3) among other things, Ecuador can be seen as a peripheral nation in the world system, or a so-called developing country. These circumstances affect the conditions for inhabitants, tourists and ecolodges.

3.1.1 Geography

Ecuador is a relatively small country situated on the northwestern coast of South America. It has a population of about 14.5 million (July 2009) and borders Peru in the south and east, Colombia in the north and the Pacific Ocean in the west (see map 1). Almost 1,000 km off the coast to the west are the Galápagos Islands, which have belonged to Ecuador since 1832. The country, including the Galápagos, covers 283,561 km² – an area slightly larger than the United Kingdom. (NE, 2009 and CIA, 2009)

The mainland can be divided roughly into three geographic regions; *La Sierra*, *El Oriente* and *La Costa* (in English called the Andes, the Amazon and the Coast). (NE, 2009 and CIA, 2009)

La Sierra is the highland region with the Andes running north to south through the center of the country. The Andes are constituted by the

west and east Cordilleras, in between which is an elongated plateau at an elevation of 1,800-2,600 m. The capital, Quito, is situated in the north end of this plateau and hosts about 1.6 million of the highland inhabitants. The climate in Quito is described as eternal spring, with almost constant average day temperatures of 17-20 °C, but it varies throughout the region from nearly tropical on the lowest plateaus, to arctic in the highest mountain areas. The highlands are relatively dry but have a slightly rainier season from October to May. Average annual precipitation varies between 300 and 1,500 mm depending on altitude and location. (NE, 2009 and CIA, 2009) An ecolodge in this kind of climate is likely to have a special need to stay dry, have good insulation and indoor heating.

The Ecuadorian Amazon, *El Oriente*, is situated east of the Andes and covers 40 % of the country and 2 % of the entire Amazon rainforest. Average rainfall is 5,900 mm per year, average annual temperatures are 23-27 °C and the humidity is always high, sometimes above 90 % for several months (NE, 2009). In this type of climate there is no need for heating but rather cooling and protection against the humidity, both for the sake of the tourists as well as for the building material.

The tropical rainforest hosts large numbers of endemic species and the succession speed is high. Several rivers that constitute some of the origin of the mighty Amazon River divide *El Oriente* horizontally. Napo River is one of the rivers that run through the Ecuadorian Amazon, and is one of the country's largest rivers with a total length of 1,300 km before it connects to the Amazon River. For some of the stretch, the river borders Ecuador's largest national park, Yasuní. Just like along any other river, this means that what is emitted upstream will travel downstream and might spread in the entire delta and connecting tributaries. The Amazon River system is mighty and swallows a lot of impurities, but nonetheless, an ecolodge living up to its name should be especially careful with affecting the water.

The Ecuadorian Amazon also hosts Yasuní National Park, Ecuador's largest national park covering an area of 16,820 km², or 6.6 % of the country. Yasuní was founded by the Ecuadorian government in 1979 and is situated between the Napo and Curaray rivers. Additionally,

UNESCO declared it a Biosphere Reserve in 1989 (MAB, 2007), due to its extremely high biodiversity and research value, and for the sake of safeguarding sustainable development within its boundaries. Oil companies as well as indigenous communities of traditional lifestyles, with for example spear hunting and no electricity, are located within Yasuni.

The western part of Ecuador is the lowland zone called *La Costa*. It stretches from the northern province of Esmeraldas, down to El Oro province on the southern-most Ecuadorian Pacific coast. The area is relatively flat and runs from the coastline and 160-190 km inland, to the topographical line of 500 m at the base of the Andes. The climate is hot and fairly stable throughout the year, with average day temperatures of 23-25 °C. Most rain falls from January to May with around 2,000 mm in the north but only around 275 mm in the south. (NE, 2009) The ground in this region is of young sedimentary rock, making the soil fertile and good for agriculture. An ecolodge here has for example good possibilities of getting locally grown food throughout the year.

Where the Andes meet the plains of the coast and the Amazon are areas called *cloud forests*. These forests resemble the rainforest in their vast amount of species, but are more temperate than tropical since they are located on higher altitude; 1,200-3,000 m (Bruijnzeel & Hamilton, 2000). Warm air from the coastal and rainforest plains rise along the Andean slopes, cool and release moisture as dew and light rain over the cloud forests. The evapotranspiration of the plants is quite high and constant, which explains the very common cloud cover even during drier periods. The soil in a cloud forest is almost constantly saturated with water, and landslides occur often. An ecolodge in this area would for example need roofs that can cope with the humidity and foundations that can stand landslides.

Dissected by the Andean Cordilleras and having a lot of saturated volcanic soil, Ecuador is constantly struck by earthquakes, volcanic eruptions, landslides, floods and periodic droughts.

Anthropologically caused environmental problems are deforestation, soil erosion, desertification, and pollution mainly caused by the oil industry. In the Amazon, the oil companies create corridors cleaned from flora

and fauna to get to their designated drilling spot, pollute the air by the burning of extracted gases, and pollute water and soil with oil leakages and waste dumping. (NE, 2009 and CIA, 2009)

3.1.2 History

Ecuador shows traces of inhabitants as far back as 7,000 BC, and only Native Americans inhabited it until the Spanish conquistadors arrived in the early 1500s and made it a Spanish colony. Already then, a division formed between La Costa as an expansive trade region and La Sierra as a conservative, landed proprietors' region. Also, slaves began to be imported from Africa, since the growing number of plantations exporting for example cocoa, needed labor. (NE, 2009 and CIA, 2009)

The Spanish were defeated in 1822 when Antonio José de Sucre won a battle close to Quito. de Sucre was a general under Venezuelan Simón Bolívar, who then formed Gran Colombia constituted by Panamá, Colombia, Venezuela and Ecuador. In 1830 Ecuador broke free and became an independent republic. Since then, the rule of the country has been tossed between generals and politicians, conservatives and liberals, strong Catholics and secularized socialists. In September 2008, the Ecuadorians voted for the implementation of the nation's twentieth constitution. Additionally, Ecuador has had nine different heads of State since only 1988, which adds to the country still being considered politically instable. (CIA, 2009 and NE, 2009)

Ecuador lost large portions of land during different territorial disputes, mainly with Peru, the last one ending as late as 1999. During the previous century, the fights for land have mainly been based on the search for oil. (NE, 2009 and CIA, 2009)

The Natives of Ecuador consist of several different tribes, such as Shuar, Waorani, Cofán, Cañari and Otavalo. The majority speaks Quichua and has been more or less oppressed in various ways since the Peruvian Incas invaded in the 1400s. Today, the natives are socially subordinate the whites and the mestizos, but are "ranked" higher than the small group of African descendants that were brought to Ecuador as slaves by the colonialists. (NE, 2009)

3.1.3 Economy

The GDP per capita in Ecuador was US\$ 7,500 in 2008, placing the country as number

123 of 229 in CIA's "the World Factbook". In comparison, the GDP per capita in 2008 was US\$ 8,500 in Peru, US\$ 9,200 in Colombia and US\$ 38,200 in Sweden.

The percentage of Ecuadorians below the poverty rate was 35 % in 2008, the inflation rate was 8.4 % the same year, and the unemployment rate was 8.5 % in 2009. Since the population is so young, 100,000 new jobs are required yearly simply to keep the unemployment rate stable. (CIA, 2009 and NE, 2009)

The national currency used to be the sucre, but was changed to the US dollar in 2000 after Ecuador had gotten into a deep financial crisis in 1999. The entire banking system collapsed and unemployment and inflation rates skyrocketed. The dollarization helped stabilize the economy and the country's finances have slowly improved since. (CIA, 2009)

Ecuador's main exports are petroleum and non- or little processed commodities such as bananas, cut flowers, shrimp, cocoa, coffee, hemp, wood and fish. Of this, 34 % was sold to the US in 2009. Industrial materials, nondurable consumer goods, fuels, and other highly processed commodities are the main imports and, also in 2009, the majority was imported from the US (27 %) and Venezuela (10 %). (CIA, 2009)

Oil accounts for more than half of Ecuador's export earnings, and is the fuel for about half of Ecuador's electricity production. This means oil extraction is very important to the country, and the business is being diversified and expanded, e.g. into the national park Yasuní. The second largest export is agricultural products (26 %), and the sector also employs 28 % of the national work force. Tourism provides the second largest inflow of foreign currency (after the oil industry), and the main destinations are Quito, the Amazon and the Galápagos Islands. (CIA, 2009 and NE, 2009)

3.2 Description of case studies – Geography and history

This section gives a short presentation of the studied ecolodges regarding their immediate surroundings, why they were started and what constitutes them today. The following information, unless noted differently, is based on interviews with lodge managers, staff and visitors of each ecolodge respectively, and on personal observations during the visits. See map 1 for the rough location of each lodge. A list of

all interviewees and dates of interviews is found in appendix A.

3.2.1 Rainforest – Sani Lodge and Napo Wildlife Center

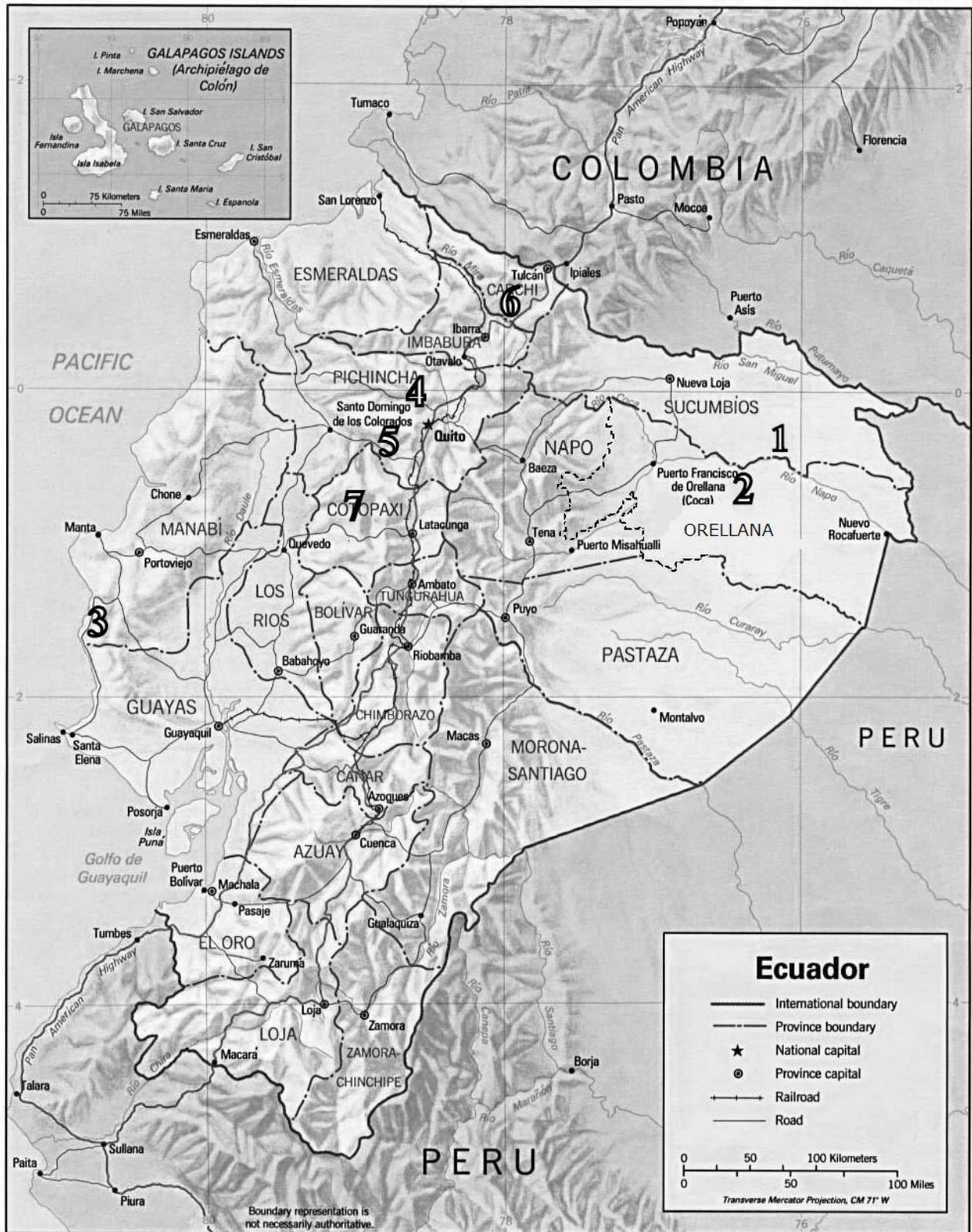
The two case studies in El Oriente are Sani Lodge and Napo Wildlife Center. They are situated on the Amazonian lowland plateau on either side of the Napo river; Sani in the Sucumbíos province on the north bank, and Napo Wildlife Center in the Orellana province on the south bank. To get here from Quito one can either fly or take the bus to the city of Puerto Francisco de Orellana, also called Coca. The flight from Quito to Coca takes about 20 minutes and costs around US\$ 60, while the bus from Quito takes 8-10 hours and costs US\$ 8.² In Coca, tourists are picked up by lodge staff and transported by motorized canoe 60-70 km (3-4 hours) downstream on the Napo River.

Sani Lodge (marked as 1 in map 1) is situated by the small lake Challuacocha, connected to the Napo River by a few km along a small creek. The lodge is owned and run by the Sani, an indigenous Quichua speaking community of about 400 people. The Sani have been living in the area since before the Spaniards came in the early 1500s. In the 1960s they were able to buy the land from the government, making it legally theirs. Today, the land of the Sani community measures more than 39,000 ha and is the largest privately owned area in all of the Ecuadorian Amazon. It covers both sides of the Napo River and overlaps with Yasuní National Park in the south with about 19,000 ha.

The community is spread out along the river, each family living on their own designated piece of land, which measure 0.3 by 1 km respectively. A community center, a school and a sports field are also based along the river, roughly in the middle of the elongated community.

In 1998, an oil company came to probe the area for possible oil reserves. The company thought they had found oil and offered jobs, to build a school and new houses, and US\$ 400 per month and family for 20 years, in exchange of the drilling rights of the land. The Sani community agreed and the company began extracting oil; a story that is common in the

² Prices as of October 24 2008. A raise of 10% is expected as of January 1 2009 on all national flights.



Base 801651 (801215) 5-91

Figure 2. Map of Ecuador with the approximate locations of the visited ecodges, numbered in order of visit; 1) Sani Lodge, 2) Napo Wildlife Center, 3) Alándaluz, 4) Maquipucuna, 5) Bellavista, 6) Polylepis, and 7) Black Sheep Inn. The numbers and the border between Napo and Orellana province have been added by the author and are to be considered representative but not exact. The original map is sourced from Perry-Castañeda Library Map Collection at University of Texas Libraries.

Amazon. However, no oil was found, so the company left without paying. The same company then found oil in an area downriver, but in order to transport the oil to a place where they could export it they needed to build a pipeline. The shortest stretch for this pipeline would go straight through the land of the Sani community. The oil company now offered US\$ 1,000 to each family, but the community turned down the offer.

Orlando Hualinga, a community member with 20 years of working experience with oil companies, had the idea of placing a lodge by the Challuacocha lagoon, since tourists were already coming here from other lodges along the river to look at birds and caimans. After a year of negotiations, the oil company agreed to pay for the construction of a lodge and began to build the Sani Lodge, as well as the pipeline, in 1999. The lodge was finished in the year 2000 and the first guests arrived in 2001.

The pipeline is buried two meters into the ground and runs about eight km north of the lodge. There are no trails in that area and lodge staff has very rarely brought anyone there.

Sani Lodge itself consists of eight cabins with room for 2-3 people, a larger cabin with four rooms for families and larger groups, and a campsite with five buildings that each fit 2-3 tents. In total, Sani Lodge can host 34 guests, and the average duration of stay is four days and three nights. Guests dine in a large, open dining room that is connected to the kitchen, and can spend free time in an adjacent building called the bar, also open and airy.

Jungle hikes are normally made twice a day in small groups of 2-6 visitors with one local tribesman and one bilingual naturalist guide. Sani also has a wooden platform located 33 m up in a kapok tree about 0.5 km into the forest, where tourists can watch birds from just above the canopy at dawn and dusk.

Napo Wildlife Center, NWC, (marked as 2 in map 1) is just south of the Napo River, about 60 km downstream from Coca and 30 minutes upstream from Sani Lodge. It lies by Lake Añangu, connected by a sinuous creek to the Napo River. It is the only lodge operating inside Yasuní National Park and cooperates with the park regarding nature conservation and sustainable tourism.

NWC is owned and run by the Añangu community, which today consists of 176 people in 26 families. In 1998, the non-profit organization Tropical Nature contacted the

community since they had heard there was an interest in starting some kind of tourism business. The Añangu did not want to do business with oil companies since they knew it was only short-term profit and had also seen the damage the oil companies could do to the ecosystem. Some neighboring communities had started ecolodges and the Añangu were interested in doing the same. The US-based organization and the Añangu community made an agreement that they would build Napo Wildlife Center as partners, and that Tropical Nature would stand for all expenses while the community provided free working hours. Construction began in the year 2000 and by September 2003 they were open for business. Unfortunately, the two parties got into a financial dispute and today NWC does not want to have any kind of connection to Tropical Nature.

The lodge counts 12 same-size cabins with room for 36 people. Common areas such as the restaurant and lounge area are gathered in a three-story building, which also hosts the kitchen and the staff dining room. Permanent staff sleeps together in large rooms in an adjacent building, and bilingual guides share a third, smaller, building. Daily activities are similar to the ones at Sani; two hikes per day in the area, with one local and one bilingual naturalist guide, where visitors learn about the local flora, fauna and culture. Bird watching can be done either from the 35 m metal tower about 1 km away, or at the two nearby parrot claylicks, a popular tourist attraction where about a hundred birds of 4-5 different species gather everyday to eat a special kind of clay that neutralizes the toxins in the seeds and fruits they also eat. Since NWC cooperates with the national park, their guests enter the claylicks for free whilst the adult price for other foreigners is US\$ 20.

3.2.2 Coast – Alándaluz

Hostería Alándaluz (marked as 3 in map 1) is situated on the beach along a coastal highway, 15 minutes south of the small town Puerto López in the province of Manabí. It is the largest ecolodge of the case studies with a capacity of up to 150 guests. It also claims to be the largest construction of bamboo in all of the Americas. The lodge stands on four of its 25 hectares, and consists of 20 cabins, and 16 rooms divided on four larger houses.



Figure 3. Some of the bamboo construction that constitutes Hostería Alándaluz and its restaurant.

High seasons stretch from June to September (whale watching season) and from December to April (due to the drier and warmer weather). During these months, the lodge is often fully booked with 120 guests. Another 30 guests can be hosted in the campsite next to the lodge.

This is the only visited lodge that does not offer activities themselves, but an agency in Puerto López is recommended for adventure and nature excursions to for example the island Isla de la Plata (also known as “Poor Man’s Galápagos”) and the Machalilla National Park a bit further up the coast. Hiking and biking can be made in Cantalapiedra, a 320 ha area belonging to Alándaluz and situated about 45 minutes south by car.

Hostería Alándaluz first opened its doors to tourists in 1989. The idea and initiative came from Marcelo Vinueza, an Ecuadorian from Quito who works as a consultant in projects concerning ecology and sustainable development. He had a wish to support the local communities through ecotourism and to conserve the primary forests of Cantalapiedra.

The forest area of Cantalapiedra became a part of Alándaluz when it was for sale in 1991. Today, it functions as a conservation area and wildlife sanctuary, and is also where the majority of the lodge’s fruits and vegetables come from. Farming is done on 20 of the 320 ha, and includes pastures, bamboo forests, and organic crops.

Alándaluz and the reserve of Cantalapiedra are co-owned by 50 people from 13 different countries. These persons work for example as architects, physicians, artists and biologists and have all been invited to manage and support

Alándaluz. Following Marcelo Vinueza’s idea, the co-owners do not receive a salary since Alándaluz is not to be run for profit. Instead, all revenue is to be invested in maintenance, conservation and various projects. The lodge and Cantalapiedra are managed mainly by Marcelo Vinueza and the general manager, who both live in Quito, together with an on-site administrator.

3.2.3 Cloud forest – Maquipucuna and Bellavista

Maquipucuna Lodge (marked as 4 in map 1) lies in the cloud forest about 80 km northwest of Quito, in the province of Pichincha. It takes approximately 1.5 hours to get to the village of Nanegal by bus from Quito, for a cost of US\$ 1.60.³ From there, it is approximately 4 km by dirt road to the village of Santa Marianita, and then another 4 km to the Maquipucuna Lodge.

The name Maquipucuna means “friendly hand” in Quichua and is not only used for the ecolodge, but also for the privately owned reserve it lies in and for the foundation that owns the lodge and the reserve. The Ecuadorians Rebeca Justicia and Rodrigo Ontaneda created the Maquipucuna Foundation in 1988. It is a non-profit organization with the purpose of protecting the land and its biodiversity.

When initially bought and created by the foundation, the reserve measured 3,000 ha and consisted mostly of pastures, farmland, and clear cuts made by a forestry company. With time, more land has been bought, and today the reserve covers 6,000 ha. The majority of these hectares have been left to grow freely, and today more than 90 % of the reserve is covered by primary and secondary forest. Maquipucuna Reserve is now located in an area of the Ecuadorian cloud forest classified as a biodiversity hotspot. It is almost completely surrounded by the government protected area of Cuenca Alta del Rio Guayllabamba (CARG), and a grand idea for the future is to connect these two reserves with other reserves and create a protected corridor that would stretch all the way from the cloud forest to the Pacific coast.

The Maquipucuna Lodge is located at the northern tip of the Maquipucuna Reserve, right next to Umachaca River at an altitude of about 1,300 m. It was opened in 1989 and initially intended for researchers and volunteers.

³ Price as of November 2008.

However, since the foundation is a non-profit organization, a lot of work is constantly dedicated to receive funding for their projects, so in order to create an income for the foundation as well as job opportunities for the locals, the idea of running the lodge as a tourism business was formed.

In 1992, construction began of what is currently the main accommodation building, called Umachaca Lodge, and the first tourists arrived in January 1995. Today, the lodge can host up to 40 guests, 16 volunteers and 14 staff at the same time. High season is normally July to October and an average year the ecolodge hosts 1 500-1 800 visitors (4-5 visitors/day).

Daily activities include hikes in the area, either self-guided or with one bilingual and one local guide, visits to the closest community Santa Marianita and its local handicraft cooperative, or visits to the relatively close ecolodge Santa Lucia with its production of organic spirits made from locally grown organic sugarcane.

Maquipucuna Foundation runs several different projects regarding nature conservation and sustainable development. It owns for example an organic coffee plantation with shade grown Arabica plants. Growing the coffee plants in the shade of taller plants is better for birds and wildlife than conventional plantations, and additionally produces small amounts of e.g. lime, plantain (a type of banana) and guava, which can be served at the lodge. Most of the coffee beans are exported to the US where they are roasted and sold, but some are roasted in Quito and returned to the lodge for consumption or sold to visiting tourists.

A three-year reforestation program is also run by the foundation and the current goal is to reforest 260 ha, mainly with species native to the cloud forest in this area. These areas have been cleared for fuel and building material, but since the foundation created the reserve and built the ecolodge, forest felling has decreased by 80 %.

Researchers and scientists still visit every year and projects with younger students from e.g. Quito are being developed. Any profit from the lodge is reinvested in conservation and reforestation projects, among other things, or used to provide the school in Santa Marianita with computers and other material. Hence, the lodge is run as another means to support the local communities and to help the foundation economically and as a marketing tool.

Bellavista Cloud Forest Reserve and Lodge (marked as 5 in map 1) lies south of Maquipucuna and two hours' drive west of Quito, on steep slopes at an altitude of 2,200 m. It consists of seven buildings of various age, size and style. The lodge can today host up to 50 guests, but the normal is 10-15 visitors at a time. High season stretches from May to August, and during 2008 overnight visitors were on average 582 per month (19 per day), varying between 927 in July and 316 in September.

One morning and one afternoon hike are offered daily to the visitors and adjusted as much as possible to the interests of the group. The trails vary in length and are all created and maintained by Bellavista staff. Most people come to Bellavista for bird watching and all the guides have good knowledge on the topic. Feeders hang throughout the lodge area to attract humming birds, since the multitude of these species are one of the things Bellavista is the most famous for.

An Englishman named Richard Parsons owns Bellavista. He arrived in Ecuador for the first time in 1982, just finished with his undergraduate degree in languages in England and on his way to work as a guide in the Galápagos Islands. He met his future Colombian wife Gloria, and sharing a wish for conservation, they later returned to Ecuador and bought a piece of land in 1991. The land measured 55 ha and was issued by the Ecuadorian government under the 1973 Land Division Act. This act was intended to help poor people provide for themselves better through farming, and meant that richer people who owned a lot of land without living from it were legally forced to sell it. Therefore, Richard Parsons could first buy the rights to the land from the previous owner and then purchase the land itself from the government. With his then graduate degree in natural resource management, Richard Parsons wished to move there with his wife. To be able to make a living and to afford protecting the land, the couple decided to build a tourist lodge. The first tourists arrived in 1995 and stayed in the then only building, the Dome, which got its name due to its spherical shape. The environmentally friendly adaptation of the lodge was based on Richard Parson's personal conviction of nature conservation and sustainability. He is currently the general manager and his wife Gloria is the owner of Bellavista Cloud Forest Ltd, a company created for administrative purposes.



Figure 4. The valley of Polylepis Lodge. The forest of polylepis trees covers the valley floor while the frailejones grow up the slopes.



Figure 5. Polylepis trees in the forest.

Initially, most of the land was pastures or clear cuts and the majority of it has been allowed to grow back freely. Today, the land of Bellavista measures 400 ha, added little by little over the years. Together with a few neighbors, a common decision has been made to protect the land owned by these people, in total measuring 700 ha, from for example deforestation and invasion of oil companies. However, an oil company wanted to buy land from Richard Parsons in order to build a pipeline through the area. The company was fought, but eventually the pipeline was buried across the land of Bellavista in 2001-2003 in return for money.

3.2.4 Highland – Polylepis and Black Sheep Inn

The highest located case study is *Polylepis Lodge* (marked as 6 in map 1), at 3,600 m in the province of Carchi, bordering Colombia. From Quito it takes about four hours by bus north to the small town of El Ángel, and then it is another 13 km to the secluded valley in which Polylepis Lodge lies on 12 ha. The lodge consists of 13 buildings made of rock, wood and grass – all derived from the area – and can host up to 50 people.

During the Pleistocene period, the area was covered by a glacier, which shaped the valley and helped create its topsoil (see figure 4). Blended with the ashes of an ancient eruption of the nearby Chile volcano, the area turned very good for polylepis trees. The oldest trees in the valley today are about 2,000 years old (see figure 5). The name of the lodge is borrowed from the trees that are one of the two special

features of this valley. Polylepis trees grow very slowly and even though they do exist on other locations in Ecuador, there are no others of these sizes and ages. The other special feature with the valley is the frailejon plants that grow on the Andean páramo; the high elevation plain with water saturated soil. On the slopes surrounding the valley of Polylepis Lodge, an endemic type of frailejon grows, which together with the polylepis trees bring the valley a high preservation value. The valley is also close to the El Ángel Reserve that hosts 90 % of the world's frailejones.

Fernando Acosta, an Ecuadorian from Quito, was in the area in the year 2000. He was shown the valley and its polylepis trees and the possibility of running a tourism business here made him decide to buy the land. He bargained with the landowner and bought 12 ha of the valley the same year. The construction of the lodge commenced in the year 2000 and was finished by 2003. Since then, about 30,000 tourists have visited the site, and the estimated amount of visitors during 2008 was 7,000, averaging 19 visitors per day. Fernando Acosta is still the owner and general manager, and has plans to build a spa in one of the existing buildings. Expansion of the Polylepis Lodge is improbable according to Fernando Acosta, due to the geographical limitations of the valley and the possible threat it might pose to the polylepis trees.

Black Sheep Inn, BSI, (marked as 7 in map 1) is situated on a slope at 3,200 m, about 100 km southwest of Quito as the crow flies. It can be reached in 6 hours by bus from Quito, and lies just outside the rural village of Chugchilán.

It has a slightly warmer and drier climate than Polylepis Lodge and is located on a highland plateau, surrounded by small ridges and gorges. There is no national park or reserve in the immediate surroundings, but the Ilinizas Ecological Reserve and Cotopaxi National Park can be reached in a few hours by car.

The American couple Michelle Kirby and Andres Hammerman was backpacking in the area in 1992 and fell in love with the scenery and people. They returned in 1994, were offered to buy a piece of land from a local family and started building a lodge. Black Sheep Inn first opened in 1995 and is today renowned for its sustainability practices. The couple has designed, built and evolved the lodge themselves based on their interest in sustainable tourism, low-impact living, and social responsibility. It has won and been shortlisted for numerous awards by for example National Geographic, Skål International, and the Smithsonian Magazine.

Black Sheep Inn consists of seven buildings of various sizes. A total of 30 guests can be accommodated and on average the lodge had more than 10 guests per night in 2008. Visitors are encouraged to go on self-guided hikes in the area, visit local businesses such as a cheese factory and a factory for handmade wooden furniture, or to hire a local guide for full day hikes for example to and from sites within the Ilinizas Ecological Reserve.

3.3 Description of case studies – Environmental sustainability

As mentioned in section 2.2, the chosen indicators of an ecolodge's environmental sustainability are the ways construction, water, energy, food and waste are managed. The following section describes the case studies regarding one of these indicators at a time. This way, the differences and likenesses between how the case studies have solved similar problems are shown, together with the variation in challenges the local environment brings.

The following information, unless noted otherwise, is based on interviews with managers and staff at each case study and on personal observations during the visits. See appendix A for the initial open-ended questions from the semi-structured interviews, and appendix B for dates of all interviews and contact information of the visited lodges.

3.3.1 Construction

The environmental sustainability regarding construction is mainly focused around two factors: *material* and *design*. Choosing more suitable and appropriate materials can decrease the environmental impact, and the design of the buildings can for example help keep energy use down by adapting to the local climate, provide tourist education in sustainable design, and provide a more authentic cultural experience if using local traditional design. As Mehta et al. (2002) put it, “carefully planned and executed construction can be considered the cornerstone of successfully sustainable development”.

The *material* most used at the highland case studies of Polylepis Lodge and Black Sheep Inn is stone. Fernando Acosta, owner of Polylepis, had all his low, one-story buildings built of stone dug up just outside the valley, while BSI used its stone together with wood and clay as the main construction materials.

Maquipucuna Lodge in the cloud forest and Alándaluz on the coast are built mainly from locally grown bamboo. To compensate for the production of this bamboo, other areas owned by the lodges are being reforested with naturally occurring plant species, and primary forest is being protected.

Napo Wildlife Center is built mainly out of concrete and adobe (sundried clay), while all the cabins at Sani Lodge are made of wood. The wood was bought in Coca and transported downriver, just like the concrete needed for the pillars the buildings stand on. The leaves that constitute the roofs are palm leaves cut locally. They need to be replaced relatively often, but since the speed of growth is so high in the rainforest, it is considered feasible to collect the leaves from the private land of the Sani without causing permanent damage. The docks by the Challuacocha Lake are also made completely out of wood and several of the locally used canoes are made traditionally from whole tree trunks.

Bellavista uses several different kinds of materials for their buildings; wood, adobe, concrete and bricks, since almost all their buildings are built with different designs.

All the lodges visited have foundations of concrete, which was chosen for its durability and ability to withstand moist and large temperature differences.



Figure 6. One of the cabins at Sani Lodge, built in local traditional design as seen in figure 7.



Figure 7. Traditionally built private cabins of the local inhabitants, whose design the cabins of Sani Lodge are based on.

Sani Lodge has used traditional *design* that is adjusted to the climate in the rainforest (see figure 6 and 7). The leaf roofs are designed according to the local style, which promotes natural ventilation and sufficient shelter for the guests, as well as habitat for insects and small animals. The cabins are also elevated for better airflow under the buildings. This provides further cooling and ventilation, which makes electric air conditioning excessive. It also lets animals and insects move more freely on the ground and gives a visual impression of buildings that are floating lightly above ground instead of being heavy obstacles.

Between the Sani cabins are wooden walkways that were originally built directly on the ground. At the time of the visit, they were being elevated about 20 cm in order to have less impact on insects and plants and for the wood to last longer.

The cabins at Napo Wildlife Center were initially built in the same way as the ones at Sani Lodge. The wood was also bought in Coca, since cutting trees within the national park Yasuní is only allowed for household use. Architects from Quito helped the locals with the design and calculations. Unfortunately, the wood began to rot fairly soon and termites attacked a lot of it. In order to save money and material, concrete and clay was also bought in Coca. Foundations and pillars were cast on site to keep the buildings off the ground, and clay was put as a protective coating on the outside of the cabins. Each lodge is now put atop a thick concrete foundation, has concrete stairs leading

up to a solid front porch, and adobe walls, which did not seem traditional in this area at the time of visit. The thin walls at Sani Lodge allow for natural cooling by wind, while the thick adobe walls of NWC function as insulation from the heat. These two designs provide different solutions to a common challenge.

Bellavista Lodge in the cooler cloud forest has an interesting example of design in its oldest building called the Dome. It has large windows that take good advantage of natural lighting and heating, and an almost spherical shape that assists with the spreading of the heat, according to owner Richard Parsons.

The airy bamboo construction of the main building at Alándaluz is also an interesting type of design. The high ceiling and walls are all made of varnished bamboo, topped with palm leaves. The bamboo is said to last for several decades if looked after correctly. The salty winds from the Pacific flow freely through the building, providing constant cooling and ventilation, and the high ceiling shadows from the midday sun but allows for more natural lighting in the morning and late afternoon when the sun is not as intense.

Maquipucuna also has a traditional leaf roof, but just as for Alándaluz, the leaves have to be transported from the rainforest since they do not grow in the lodges' vicinity.

3.3.2 Water

Depending on the location, water can be everything from a stressing scarcity to a

devastating force. Yet it remains essential to living organisms. An ecolodge needs water for washing, cooking, machinery, heating and cooling, personal consumption, and more. Chapter three in the book “International Ecolodge Guidelines” mentions four main areas of good water management: *conservation*, *harvesting*, *reuse* and *treatment* (Mehta et al., 2002). These areas, together with *water source*, *potable water*, and *monitoring* cover the entire journey of water through an ecolodge: source and quality of water, ways to keep the consumption down, and how to treat it when it is to be discarded.

The main *water source* for six of the seven lodges is a private, local source. Alándaluz on the coast is the only lodge that gets all its water from the municipal system. At the other end of the scale of case studies is Black Sheep Inn, which has spread its sources between a natural ground water spring, rainwater harvesting, a pond, and the municipal system. Apart from a groundwater well, Maquipucuna also uses rainwater harvesting; a reliable source of plenty in a cloud forest with frequent precipitation. One of the Amazon lodges gets its water from a dug groundwater well, while the other is pumping it from the adjacent freshwater lake. To do this, both lodges use diesel fuelled pumps.

The other lodge that has a surface source is Polylepis in the water abundant Andean páramo. Since the soil is so saturated with water, they have simply dug a small trench winding its way down one of the valley sides, where water collects and runs down to the lodge.

Bellavista in the cloud forest relies solely on a couple of natural springs, so it is only BSI and Maquipucuna that have spread their water demand over several sources.

Regarding *potable water*, five of the seven case studies buy purified bottled water from the nearest society. The general reason mentioned is that it is for the sake of the tourists, so they will not get sick and can feel safe drinking it. For example at Napo Wildlife Center the tap water is tested safe to drink, but could cause problems for someone not used to its bacterial flora.

The two case studies not buying purified water that has been transported long distances are Maquipucuna in the cloud forest and Black Sheep Inn in the highlands. Maquipucuna staff boils the water from the lodge’s groundwater well and make it readily available for the guests in a 25-liter container that initially contained

purified water. Guests who ask will find out that the water is local and boiled, instead of industrially treated and transported there, which the label on the container indicates. At BSI, water is treated with ozone that kills bacteria before being reduced to oxygen, O₂. The ozone is created with electricity and does not reach the surrounding air, so this way of purifying water is neither harmful to the environment nor to human health, according to lodge manager Andres Hammerman.

Water conservation involves for example choice of low-consuming appliances and processes, and refraining from water devouring features such as golf courses and swimming pools. None of the case studies owns a golf course, but one has swimming pools on its premises. Alándaluz, right by the Pacific Ocean, has two swimming pools that are said to be unheated and filled with seawater for least environmental impact. Since the beach by the lodge carries warnings of strong undertow, management wants to provide expecting tourists with a safe alternative.

Only one of the case studies had composting toilets, which neither consume any water nor produce any wastewater that has to be purified.

BSI has spread its water sources over a natural spring, the town water system, a pond, and rain harvesting. So if a source fails their water supply is still secured. NWC and Polylepis both retrieve water from surface sources, while coastal Alándaluz receives all its water from the municipal system.

Some of the case studies asked each new guest to try to conserve water by taking short showers, but none of the case studies made water conservation a major issue.

Monitoring of the water consumption is a good way of staying updated on the amounts used and keeping track of the efficiency of possible conservation efforts. Only three of the case studies monitor their water consumption, out of which two have the Smart Voyager certification.

It was relatively easy for NWC to install a monitor since all the water they use is pumped up to an elevated tank from where the water flows to all houses using gravity. The monitor then keeps track of the outflow from the tank. The week of the visit was the lodge’s first week of monitoring, and they had then been using about 5 m³ per day. This comes to 139 liters per

person if fully occupied with 36 guests. The largest lodge, Alándaluz, uses about 6 m³ per day during high season, which comes to only 40 liters per person when fully booked. At Sani Lodge, the water is not monitored, but their ground water pump shuts off automatically when it has filled two underground tanks of 1.1 m³ (300 gallons) each. Since the pump is operating every day, their use can be estimated to about 2.3 m³ (600 gallons) per day, or 69 liters per person when fully booked with 33 guests. One of the lodges said they could not implement a monitoring device since it would lower the pressure in the pipes, preventing the water from reaching the cabins properly.

Water harvesting is done by collecting precipitation that falls on roofs, in barrels or on other constructions. Harvesting systems can be relatively simple and easy to install, why implementation costs can be low. Despite this, only three of the case studies harvested rainwater.

NWC has one large barrel where rainwater is collected, but the water is only used in case of extreme shortage. BSI on the other hand has all its water used for bathroom hand washing collected from the roofs of the outhouses and stored in small barrels mounted on the outhouse walls.

Reuse of water is another way of decreasing a lodge's net water consumption. When hand washing at BSI, a pipe from the sink leads straight to a flowerbed inside the bathroom where the grey water with the dissolved biodegradable soap is reused directly for watering of the flowers. Hence, no water is wasted and a green view and nice smell in the bathroom is gained.

Treatment of wastewater should be of high priority to an ecolodge. Leaching of untreated wastewater to the surrounding ecosystem could cause ecological disruptions, such as eutrophication, increase in algae and spreading of diseases and toxins. By implementing water conservation and use of biodegradable washing products the production of wastewater is decreased, the treatment is made easier and the risk of any harmful substance being passed on is lowered.

Black Sheep Inn, which does not have any black water due to their composting toilets, treats its grey water by first having it go through a settling tank and then charcoal and rock filters

before reaching a reed bed. The plants take up the remaining nutrients and are harvested as fodder for the lodge's sheep, llamas and guinea pigs.

NWC and Maquipucuna have constructed wetlands where both grey and black water are slowly released just below the ground surface through a pipe with small holes. Grasses growing on the wetland extract the nutrients and bacteria, and 1-2 months later the treated water finds its way out the other end of the wetlands. NWC lead the water back into the lake from where it was first pumped, while Maquipucuna lets the water, derived from a natural groundwater well, reach the river just below the lodge. NWC has a sample taken of the water going back into the lagoon every two months and has it tested by an independent company. According to manager Fausto Cornejo, the water going back into the lagoon is cleaner than the lagoon itself. Both lodges leave the harvested wetland plants for aerobic decomposition in a compost or septic tank respectively.

The black water treatment systems at Bellavista and Sani are similar. The black water from the toilets go to a septic tank where larger objects are trapped while the water trickles down through a thick sand layer before reaching the ground water again. Since the opening of Bellavista in 1995, the septic tank has only had to be emptied once.

Bellavista's grey water is brought through a pipe to a water treatment area of five levels. The levels are set as steps of concrete boxes with gravel, sand, or a grease filter in each box. The water passes from one box to the next one below, before running on to a wetland where water lilies pick up the nutrients. The water trickles on down through the soil to the ground water or to the river in the valley below. In theory, this purifying system seems adequate, but in practice it is not working since the water passes too fast between the steps which have cracks and broken pipes, and enters the wetland without necessary purification. The Smart Voyager auditor had urged Bellavista to mend their purification system, but that had not yet been done at the time of visit for this thesis.

The grey water at Alándaluz is treated by first being passed through a sedimentation tank with a sand filter, followed by one or two tanks with a gravel and sand filter. The guest rooms have two filters each, while the kitchen and bar have three filters since their water consumption is higher and the water is dirtier. It is then used for irrigation of decorative garden plants that

need a lot of water, but not for plants which fruits are harvested and served in the restaurant. Only biodegradable washing liquids are used at the ecolodge, except for detergent, since they had not yet found a detergent brand that was certified biodegradable.

Polylepis was the first lodge in Ecuador to install biodigesters, a kind of septic tank that takes both grey and black water and, with the help of sedimentation and bacteria, leaches purified water back into the environment. They have to be emptied of sludge and gas every six months, which is taken care of by an independent company.

All the water used at Amazonian Sani Lodge is first led to a smaller tank with a filter and on to larger septic tanks underground. The filter stops non-degradable items and toilet paper from reaching the septic tanks. Bacteria are allowed to break down the fecal bacteria of the wastewater in the septic tanks, and then the water is filtered slowly through the 50 cm of sand that constitutes the bottom of the tanks, before trickling its way down to the groundwater again. What will happen if or when the septic tanks are full with molten organic materia, is not clear at the moment. The treated water is also not checked for bacteria.

3.3.3 Energy

The needs for energy by a tourist operation can be infinite, but probably rarely non-existent. Electricity can be used for lighting, ventilation, heating and cooling, water pumps and cooking appliances, while combustion of fuels such as wood, gas and coal is more likely to be used for heat production. By choosing a renewable *energy source*, practicing *energy conservation* and *monitoring* the lodge's consumption, an ecolodge can lower its resource use and environmental impact.

Regarding *energy sources*, the case studies mainly use gas for heating shower and tap water, some use wood for heating rooms, and all of them have electricity for lighting and appliances. The gas used for heating water is methane or propane, bought in 25 or 30 kg containers, and connected to a burner that automatically comes on whenever the warm water tap is turned.

According to Javier Hualinga, Sani Lodge uses the cleanest of the available gases, since that is required in order to be eligible for the Smart Voyager certification. Maquipucuna in the cloud forest is experimenting with producing

their own biogas from the compost they keep in their organic garden. If producing sufficient amounts, this biogas would be used in the kitchen and hopefully to fuel a motorcycle. Andean Polylepis and BSI also have wood burners for heating in each room. For fuel, BSI only supplies wood from invasive and non-native species such as eucalyptus.

As for the electricity, the sources varied between case studies. The two Amazon lodges cannot connect to a common power grid since there is none in the vicinity. Sani Lodge gets its power from a total of 4.5 m² of solar panels, and two small diesel generators. One is only running when kitchen staff is preparing meals, and the other one powers the ground water pump when that needs to be in operation. The solar panels are mounted on the roofs of the cabins and provide enough electricity for the lighting inside the huts after sundown. There are no electrical outlets for other appliances in the huts, but guests can for example, if necessary, charge their cell phones or laptops in the dining room, shave manually, etc. A goal is to install enough solar panels to be able to get rid of the diesel generators, but as for now the economy of the lodge does not allow that.

Napo Wildlife Center has four solar panels, measuring in total about 2.5 m². These panels, together with two large diesel generators, charge 12 batteries, which supply electricity during the night when the solar panels are inactive and the generators are turned off. The generators are operating up to 12 hours per day, and use 454 liters (120 gallons) of diesel per full week. The aim is to install more solar panels, but more solar panels also require more batteries.

In the beginning of Alándaluz's operation, solar panels were installed, but their life span was severely shortened due to the salty winds blowing in from the sea. Since the solar panels did not last longer than 3-4 years, it was not financially viable at the time to invest in new ones. Maquipucuna Lodge installed solar panels in 1998, but since it is too cloudy in the cloud forest the panels were taken down already after about three months.

Black Sheep Inn also use a solar panel to power an irrigation pump, and direct sunlight to heat water in a black hose lying on shiny corrugated metal on a south-facing slope – a home made solar thermal collector. This hot water can then be used when guests want a bath in the lodge's hot tub.

The case studies, apart from the two in the Amazon, are all connected to the general power

grid, which supplies electricity mainly produced nationally by hydropower, according to several of the interviews. Polylepis Lodge did not have access to the general grid until August 2008, when manager Fernando Acosta organized and paid for a power line to be drawn from the nearest society all the way into the valley. Before that, the lodge had been dependent on a diesel generator, but have since only had to use it during power cuts.

BSI is connected to the grid but tries to use it as little as possible. Their aim is to be energy independent with their own sustainable energy sources. Apart from the solar panel for electricity to the water pump, and the solar heater for warm water, they also use gravity to create natural pressure in the water pipes instead of using an electric pump.

Energy conservation can be done by for example using passive design of buildings so that natural heating/cooling, lighting and ventilation are maximized. Several design suggestions are available in the book "International Ecolodge Guidelines" (Mehta et al., 2002), and mentioned above in section 3.3.1.

Conservation can also be done through electricity saving appliances. All of the case studies use electricity-saving light bulbs, but some still use conventional light bulbs for outdoor lighting since they are considered sturdier than low-electricity bulbs and can deal better with outdoor conditions.

NWC offers their guests a washing service since they have two washing machines and two dryers running daily with linens and other laundry belonging to the lodge. According to the staff's operation manual, the washing machines shall never be run unless completely filled. At Sani Lodge, everything is instead washed by hand by two female employees and air-dried.

Just as with water, *monitoring* the lodge's energy use is a good way of keeping track of for example fluctuations in use and the success of conservation efforts. The two cloud forest lodges, as well as Alándaluz and NWC, monitor their electricity use, even though they do not monitor their water consumption. These four, except Maquipucuna, are fully certified by Smart Voyager and have policies for energy conservation. BSI also has policies, but does not monitor the electricity use other than by the fraction that comes off the national grid and is given on the electricity bill. Sani Lodge does not monitor its use either, but since they have

applied for the Smart Voyager certification they will most likely install electricity meters as soon as it becomes mandatory.

During the visit of the first week of November 2008, NWC had just begun monitoring their electricity use and did not have any records yet. However, Fausto Cornejo estimated their electricity use to 31,200-36,400 kWh per year. According to the lodge records, Alándaluz uses 1,500 kW per month during low season and 2,068 kW per month during high season. In total, this comes to about 23,112 kWh per year.

The electricity use at Maquipucuna and Bellavista is not measured on site, but the amount is noted on the monthly electricity bill. Maquipucuna consumes about 16,500 kWh per year, depending on occupancy and activities. From December 2007 to November 2008, the electricity use at Bellavista was fairly stable with an average of 1,000 kWh per 30 days, apart from a peak in June when the electricity consumption was double than usual; 2,100 kWh. In total, Bellavista uses about 13,100 kWh per year. In comparison, an average Swedish villa uses about 20,000 kWh per year (Arnell, 2009) including heating and household electricity.

Polylepis wants to monitor its electricity use, but during the visit in December 2008 they had not yet received an electricity bill, and were therefore in the dark concerning their electricity consumption.

3.3.4 Food

Another issue that can have a large impact on the environment is food. The types of groceries, their production, transportation and possible waste from packaging and inedible parts all affect the environment.

Only one of the case studies, Black Sheep Inn, serves solely vegetarian dishes, which spares the lodge of the added environmental impact of livestock (Steinfeld et al., 2006). BSI's food is of very high quality, and comes both as Ecuadorian dishes as well as meals from all over the world. All groceries are either bought in the nearby rural community or harvested in the lodge's garden on the premises.

Both Amazon case studies have most of their food bought in Quito and flown out to the rainforest, then taken by motorized canoe for 3-4 hours downstream to the lodge. The food bought is not necessarily organic, and some kind of meat is served every day unless to tourists with special requests. Management says food

cannot be grown locally in the complicated ecosystem and poor soil of the rainforest. Only native species such as cocoa, plantain, some tropical fruits and cassava grow well here, but they demand a lot of space to produce enough for a full ecolodge, so management feel they do not have much choice than to buy food in the bigger cities and transport it out into the jungle.

Hostería Aláandaluz has an interesting solution in the privately owned reserve Cantalapiedra. Some livestock, bamboo intended as building material, and several organic vegetable patches cover 20 ha of the reserve's total 320 ha. Together, they are the main source of the lodge's food supply, and the rest is bought from local farmers and entrepreneurs.

The two case studies in the cloud forest operate quite differently when it comes to food. Bellavista has no gardens or patches on site, but cultivates 0.25 ha of fertile land about two hours away by car. There they grow some fruits, vegetables and herbs, but the majority of the groceries used are bought in Quito. Staff that does the grocery shopping is not specifically told to favor organic or local products. Owner Richard Parsons says it takes too much time and car fuel to buy produce from the locals since there would have to be many trips, which is why the only local produce is trout from a fish farm down the road. According to Parsons, it is more economical to drive for an hour to Quito, shop there, and drive back. At Maquipucuna, about 60 % of the vegetables used is grown in their own organic garden. The remaining vegetables needed, as well as chicken, are bought from neighboring communities. Beef, eggs and other ingredients are bought in Quito, but trips there are not made as often as for Bellavista. Maquipucuna also serves vegetarian meals about once a week to all their guests, while vegetarian food is more rare at Bellavista.

Andean Polylepis does not produce any food on site. However, most groceries come from local producers, except vegetables that are bought in a supermarket in Ibarra about an hour away. Vegetarian meals are served very rarely.

3.3.5 Waste

All the case studies visited created waste of different types, which is quite difficult to avoid for a business operation in general. The more important then to try to *minimize* the production, *separate* the waste produced to treat what is reusable and recyclable accordingly, *monitor* the

waste production and separation to keep track of fluctuations and trends, and be fully informed on the routines and plans for the municipal and/or national *waste management* system.

A stated plan for *waste minimization* was not mentioned by any of the case studies, but for example at Black Sheep Inn, where the owners do the majority of the shopping themselves, waste minimization is integrated in the over-all policy of causing as little environmental impact as possible.

Waste separation was done in some form at most case studies. At Sani Lodge in the Amazon, there are two waste bins in each cabin; one for organic waste, such as used toilet paper, and the other for inorganic waste. Guests are asked not to throw used toilet paper into the toilet since it accumulates on the wastewater filter, turns into a compact layer, and stops the filter from functioning properly. The staff tried to collect all organic waste, including toilet paper, in a large compost pit on the premises, but had to stop since it attracted too many animals and insects. Today, all organic waste is instead put directly into the septic tanks to be broken down by bacteria, except for food waste from the kitchen that is collected separately and given to community members as pig feed.

Napo Wildlife Center claims to manage to keep a compost in the rainforest and puts for example food leftovers, used toilet paper and pieces of cardboard for it. The farmers of the community then share the mulch to fertilize their land. Bones, lemon peel and other organic things that need more time to be broken down and thereby slow the compost are buried in holes in the ground and covered over.

Aláandaluz also keeps a compost at the reserve Cantalapiedra where they put everything organic except toilet paper. The mulch is then used as fertilizer on the flowerbeds around the lodge while the crops growing at Cantalapiedra are fertilized with manure from the chickens and pigs they keep there. Toilet paper is collected together with all other solid waste and handed over to the local municipality or to the producers of the discarded product respectively.

The manager of Polylepis said his staff separates the waste produced in the kitchen, but during observation this was not done and staff did not appear to agree with or fully understand the point of separating waste and/or minimizing it. All waste is left to the community waste management in El Ángel, the closest larger

society. Neither is anything composted in the valley since owner Fernando Acosta is afraid of intruding species, like fungus or bacteria, which he fears could attack the Polylepis trees and damage the valuable forest.

Plastic, metal, glass and paper are separated at four of the seven visited lodges. Black Sheep Inn separates soft and hard plastic, metal, paper, cardboard, glass, and food leftovers. Leftovers are either composted or given to the lodge's animals as feed, and cardboard can be chopped up and used as dry matter in the composting toilets. What cannot be reused or recycled onsite is taken to the local recycling center that BSI supported the construction and management of.

Maquipucuna Lodge only separates leftovers and kitchen waste, which are either given to the pigs or composted to become fertilizer for the lodge's organic garden.

Bellavista puts a lot of effort into their separation and splits all waste into fractions of food leftovers, plastic, paper, toilet paper, and glass. Organic waste is composted on site and the mulch is later either given to local farmers if they ask for it, or taken to Pifo and used as fertilizer on the lodge's cultivated 0.25 ha.

Monitoring of waste production is necessary to get an overview of the amounts produced, how large the different fractions are, and if efforts of minimization are having an effect. Among the case studies, monitoring was made at two of the four lodges with the Smart Voyager certification, as well as at Black Sheep Inn.

When NWC received their Smart Voyager certification they were sent forms to fill in with the weight of the produced waste, which fractions had been produced, and their destinations. The lodge was therefore about to begin measuring its waste production during the visit in November 2008, but manager Fausto Cornejo was already estimating it to 181-227 kg (400-500 pounds) per week.

Black Sheep Inn also monitored its waste production. They produced 5.7 kg per week, which is only 2.8 % of the average production of NWC (provided that NWC produced 204 kg or 450 pounds per week).

Due to the Smart Voyager certification, Bellavista's waste production is also monitored by weighing. They began monitoring in May 2008 and the data that was made available showed the waste production was 114 kg of paper/cardboard, 19 kg of metal and 110 kg of plastic during October 2008. The same fractions

measured 134 kg, 1.4 kg, and 88 kg respectively the following month. This comes to a total of 243 kg for October and 223.4 kg for November, or on average 58 kg per week; 29 % of the waste produced at NWC.

Waste management in Ecuador appear to be constituted by municipal companies, but mostly handled by private companies in Quito and other major cities, which collect some types of recyclable waste, for example scrap metal. In the countryside, where most ecolodges are located, waste management seems to be occasional trucks that come by and pick up the type of waste they can prepare and then resell.

Inorganic waste and recyclables produced at Sani Lodge are collected and brought back by boat to Coca with leaving guests. There, it is given to the local waste management, but lodge manager Javier Hualinga does not think it is taken care of properly since Coca is lacking a community recycling program. He says that if the opportunity comes to hand it over to a private waste management company, or another solution appears, Sani Lodge will most likely take it. The potable water dispensers are also brought back empty to Coca, and returned to the sellers who clean and refill them with purified water.

NWC returns all their recyclables by plane to Quito, since they say that the municipal waste management there can manage it better.

BSI is also located far out in the countryside with hours by car to the nearest larger society. They recycle and reuse most waste onsite, but have also helped building a recycling center together with the nearby community. There is one salaried employee at the recycling center, but he often has the help of his family to sweep the village and bring the waste down to the recycling center. Any profit made at the center after selling for example scrap metal goes to the people who have separated the waste. The municipal waste management program is completely separate from the local community's own system. The municipality offers to collect organic and inorganic waste, but beyond these two fractions there is no further recycling made.

The two cloud forest lodges have similar systems for waste management. Only compostable waste is taken care of on site and all other waste, separated or not, is picked up once a week by a garbage truck and taken to Quito. Polylepis does not take care of any waste onsite and leaves everything to the communal waste management.

Alándaluz can send some types of plastic containers back to the producers when empty, but apart from that and compostable waste everything is left to the relatively close municipal waste management.

3.4 Description of case studies – Socioeconomic sustainability

Before the founding of the Amazon lodges, many of the Sani and Añangu tribe members were scattered between schools in the bigger cities and employment with oil companies or other large businesses. The salary was often irregular, the unemployment rate was high, and older tribe members were noticing that younger members were disappearing to the cities, having the native communities slowly die out. With the lodge projects, tribe members are gathering again; young people are staying in the community since they have something to earn a living from, and the quality of life is rising with for example local schools and improved health care. Tribal knowledge and traditions are also becoming more interesting again since these cultural features grant the lodge a higher value to tourists. This exemplifies that a sustainable ecolodge is not only environmentally sensitive; it is also financially stable over time and a social asset to the locals.

This section provides a short presentation of the case studies' socioeconomic sustainability indicators, which are *staff*, *local community*, *tourist education*, and *certification*.

The following information, unless noted otherwise, is based on personal observations and interviews with lodge managers, staff and visitors at each case study. See appendix A for the initial open-ended questions from the semi-structured interviews, and appendix B for dates of all interviews and contact information to the visited lodges.

3.4.1 Staff

Local inhabitants from the closest communities make up a strong majority of the employees at Black Sheep Inn, and the entire staff is Ecuadorian. Only locals were employed to help with design input and the actual building of the lodge. Additionally, BSI hires solely local entrepreneurs, farmers and caretakers to meet the lodge's demands for food, guides, carpenters, material, etc. The only exceptions are the two owners who are from the United

States, occasional foreign volunteers, and special staff, such as masseuses, yoga instructors, and interim managers when the owners go on vacation. The owners have offered to educate willing locals so that they can employ them instead, and for example a local woman has trained to become a masseuse and now works at the lodge on occasion.

The permanent staff at Sani and NWC consists entirely of local tribesmen, except for the onsite administrator of NWC who is non-indigenous, but Ecuadorian. Multilingual nature guides come and go with tourist groups since they are hired by a tour operator and not by the lodge. These guides normally have higher education and salaries than the local guides, and interviews showed that some local guides were interested in studying to become multilingual nature guides themselves; something they are able to do with a proper salary from their ecolodge. The permanent staff at Sani and NWC is also exchanged regularly so that every family has the opportunity to work at the lodge if they would like to. A majority of higher educated people from the city works at the lodges' offices in Quito.

Maquipucuna and Alándaluz only hire Ecuadorians, but not necessarily local inhabitants. Most administrative staff at the lodges is highly educated people from Quito or other large cities, while the local guides and kitchen and maintenance staff are from the small communities in the lodge's vicinity.

Polylepis, with its owner from Quito, has five employees, all of which are from the same province as the lodge is located in. Bellavista has Ecuadorian staff too, but most of the guides are foreigners, mainly from Europe. About half the Ecuadorian staff is from major and distant cities, and no employee comes from the nearest communities.

Salaries were difficult to get exact information on, which could be due to cultural or social conditions. The interviews did not reveal anyone who was displeased with their salary or had trouble providing for their family, but this is most likely also connected to culture and relative to the financial situation in the country. All the visited case studies seemed to offer fair salaries, which is an important indicator of socioeconomic sustainability.

Working conditions and *staff housing* at the case studies showed different conditions and practices. A common system at the Ecuadorian

lodges seemed to be a working period of a couple of weeks, followed by an extended weekend. For example, staff at Polylepis works for 15 consecutive days followed by two days of vacation, while at Bellavista, the standard time of work is 22 days followed by eight days of vacation. Many staff members have signed contracts with this kind of schedule for several months or a full year.

Alándaluz on the coast is located close to several surrounding societies, meaning most staff members were able to commute from their homes every day. Housing was offered at the lodges where staff instead needed to stay over night during working periods due to either the lodge's remote location or the fact that staff members were not local inhabitants. For example, Sani staff members can stay in a large building visually hidden by trees from the main lodge area. They have a frequently used ecuavolley⁴ court, and can relax away from guests when off duty.

Regarding *gender equality*, BSI is the only case study that has more female than male employees. Nine people work full time and one works part time, of which three staff members are men and six and the part timer (68 %) are women.

At the Amazonian lodges, only 2-4 employees were women of a staff crew of minimum 12 ($\approx 25\%$) and up to 30 ($\approx 10\%$). The women mainly worked without contact with the visitors, and with tasks such as cleaning laundry and cabins. Staff at both lodges is exchanged regularly so that everyone – including women – from the communities has the opportunity to work at the lodges if they would like to.

At Maquipucuna, three of the 12 regular staff members (25 %) are women. The women work either in the kitchen or with housekeeping, and though they are welcome to help out with any chore, it was said they prefer leaving the heavy physical work to the men.

The same division of chores between the sexes is visible at every case study, apart from in the kitchens where both genders may work together. Normally, it is women who take care of cleaning and cooking, and men who take care of maintenance and guiding.

Only Bellavista and BSI employed female guides; foreign women as guides at Bellavista and local women at BSI.

3.4.2 Local community

Several of the case studies involved the local community or community members in different types of projects. Most facilitated the selling of handicrafts by local women to the visiting tourists, but there were also several educational projects for local school children or teenagers. Some case studies also accepted volunteers who got involved for example as English teachers at the nearest community school.

Maquipucuna runs a handicraft cooperative for the women of the village of Santa Marianita. The women pay a certain amount to be part of the cooperative, and then produce jewelry together from for example local seeds. The tourists from the ecolodge are both informed of the handicraft cooperative and encouraged to visit it. Sani's newly started project involves local women in making traditional jewelry from plant fiber and seeds, and selling the items to visiting tourists. Revenue pays for new material and some income to the involved women.

All income generated by the operation of Sani Lodge goes to an account in the community's name. Then, all salaries and expenses, such as maintenance and both community and lodge investments, are paid from that account. This way, the economic leakage is minimal and the revenue from the lodge benefits the entire community. Money is also paid from the account to the community's elderly who no longer work; similar to a social security system or retirement fund.

Sani Lodge was at the time of visit also looking to hire a permanent doctor in the community center. This would improve the continuity of the health care of the community members, instead of receiving a new volunteer physician each week or month, or even risking being without one.

Alándaluz gives back to the community in two different ways. One is by educating Ecuadorian farmers in organic agriculture by inviting them to courses at the private reserve Cantalapiedra. The other way is by running environmental groups for children and teenagers in the surrounding five communities. The groups are divided based on the children's ages and do different things involving environment, such as making paper from reused fiber, cleaning the villages and the beach, learning about different plants and how to treat water pollution, etc.

Alándaluz also takes volunteers, both from the local communities as well as from the rest of

⁴ Popular Ecuadorian sport similar to volleyball.

Ecuador and other countries. Volunteers help out with various tasks at the lodge and at Cantalapiedra, or focus specifically on a project that runs over a longer period of time.

3.4.3 Tourist education

Tourist education by an ecolodge can revolve around fostering an understanding, appreciation and awareness of local environment and culture, as written in section 2.1.1.

Regarding environmental awareness and appreciation, it was common or possible among all the case studies that the tourists were guided along trails in the area and taught about the local flora and fauna, as well as the indigenous' knowledge, uses and names for the plants, adjusted to the group's interests. Guided tours were given several times a day at the rainforest and cloud forest lodges, and upon request at Polylepis. BSI encouraged the hiring of a local inhabitant for guiding, while Alándaluz was the only case study that referred to external travel businesses for activities.

Treating guests to local dishes and cooking traditions is also a way of teaching about the local culture and life. Showing what can be grown locally, telling about the contents and traits of traditional agricultural products, and explaining possible challenges due to local climate change effects provides both environmental and socioeconomic education.

At Sani Lodge, the bilingual and local guides dine with their tourist group, but the rest of the staff eats in the kitchen. Integration between tourists and locals is however quite frequent since many tourists wish to visit one of the Sani homes, the community center or the community school.

On the inside of every bathroom door at Alándaluz is a note that explains with text and graphics how the water runs through the filters and where it ends up. Nothing similar was openly posted at the other case studies, though the managers, especially at Black Sheep Inn, were normally happy to answer any questions about the low-impact systems and sustainability efforts of the lodge.

3.4.4 Certification

All of the case studies had or had applied for certifications of various kinds. The most common was the Smart Voyager certification, which had been acquired by four case studies, in a specified, smaller version by a fifth and

applied for by a sixth case study. Maquipucuna holds the smaller version of the Smart Voyager certification for educating local inhabitants in biology and English so that they will be able to guide tourists in the forest in English. This version involves local socioeconomic sustainability but not environmental.

Another certification that one of the case studies has is called Buenas Practicas para Turismo Sostenible en Bosques Tropicales, meaning good practices for sustainable tourism in tropical forests. This certification is managed by Rainforest Alliance, UNEP, Conservation International, and Global Environment Facility, and is according to the interview a program by the United Nations for environmental monitoring.

Black Sheep Inn was the only case study not holding or having applied for the Smart Voyager certification. Instead they are certified by ASEC, the Ecuadorian ecotourism association, which manages the certification together with the Ecuadorian ministry of tourism. All the case studies, except Sani Lodge, are also members of ASEC. Membership can be established in six different versions; as an education center, tour operator, lodging business, NGO, professional or as a community. The members make up the organization and together strive for strengthened ecotourism in Ecuador. (ASEC, 2009)

3.5 Case study overview

For a facilitated overview of the data and experiences described in the above sections, see table 2. Points have been provided from 0 to 3 for none or weak (0), some (1), strong (2) and exceptional (3) sustainability efforts, in order to give a rough image of how the case studies compare to one another in practice, but also to show how efforts are divided between the different indicators.

The table clarifies that all the case studies, except for Black Sheep Inn, retrieved higher points for socioeconomic sustainability efforts than for environmental efforts. Even though five environmental sustainability indicators were investigated, the total amount of points acquired between the case studies was higher for the only four socioeconomic indicators.

Black Sheep Inn received the highest total score, which was more than three times as high as Polylepis, which got the lowest score.

Table 2. Table for facilitated overview of the case studies regarding their indicators of environmental and socioeconomic sustainability described in the above sections. 0 is given for none or weak sustainability efforts, 1 for some, 2 for strong and 3 for exceptional sustainability efforts. Points have been set for the over-all impression of each indicator and are based on the experiences and data acquired during the visits to the case studies.

Indicator	Case study	Sani	NWC	Alándaluz	Maqui.	Bellavista	Polylepis	BSI	Total
Construction		2	1	2	2	1	2	2	12
Water		1	1	1	2	1	1	3	10
Energy		2	1	0	0	0	0	2	5
Food		0	0	2	2	1	0	3	8
Waste		0	1	0	0	1	0	3	5
	Subtotal	5	4	5	6	4	3	13	40
Staff		2	2	2	2	2	1	3	14
Community		3	3	2	2	0	0	3	13
Tourist education		3	3	0	2	1	1	1	11
Certification		1	2	2	2	2	2	2	13
	Subtotal	9	10	6	8	5	4	9	51
	Total	14	14	11	14	9	7	22	

4. Discussion

4.1 What defines an ecolodge?

As Mehta et al. (2002) put it; “An ecolodge is not a traditional hut, and today’s tourist has different needs and ways of living than the area’s natives and pioneers.” But where is the line to be drawn between how much the ecolodge should adapt to the international tourist, and how much one could expect the tourist to adapt to the ecolodge? “Remember that if it is to be truly an ‘eco’-lodge, it has to attract and satisfy ‘eco’ tourists who are primarily looking for natural assets, not artificial commodities” (Mehta et al, 2002). If the ecotourism sector keeps growing annually by 20-34 % (TIES, 2006) the number of increasingly environmentally and socially aware tourists will also rise. This might mean generally altered expectations on accommodation standards as the focus of the visitors hopefully switches from materialistic aspects to the lodge’s overall quality of sustainability and authenticity.

Ecotourism has grown notably fast the last couple of decades and will continue to grow rapidly according to analysts (TIES, 2006). However, if an increasing number of ecotourism operations draw an increasing number of visitors the impacts on the local environment and natural assets will increase as well (Stern et al., 2003). It should therefore be included in the ecolodge concept that the main intention of a business is neither to expand infinitely nor to be operating strictly for economic gain.

Carter et al. (2004) say that both legislative and economic incentives can support a tourism business in improving its environmental performance, but add that the adoption of an environmental and socially ethical philosophy throughout the operation will be more efficient in the long run. They explain that a single person of high executive rank can successfully spread this kind of philosophy within the business, but the person needs to make sure the philosophy is firm within the organization’s policy for it to influence the entire business even when the executive person is not present. The importance of this type of background to a lodge’s sustainability became evident at the seven case studies. The more knowledgeable and devoted executive person, the more sustainability practices influencing increasing parts of the business.

As an example, Polylepis Lodge was founded by a businessman who had come across a rare location he thought tourists might want to visit, and started a business. The valley is thereby protected from exploitation since the lodge depends on its conservation, but most other environmental and socioeconomic sustainability indicators scored low (see table 2 in chapter 3). The manager is a businessman and runs his operation primarily as such, not for local environmental and social benefit.

As the opposing example, Black Sheep Inn is founded and run by a highly devoted and knowledgeable couple. Their goal is to run a lodge with as little negative environmental impact and as high return as possible for the local socioeconomic welfare. They are not running their lodge to maximize profit and have reached extensive sustainability targets, both environmentally and socioeconomically.

To discuss the case studies more in detail, the following sections provide thoughts on the specific indicators of environmental and socioeconomic sustainability described in chapter 3; construction, water, energy, food, waste, staff, local community, tourist education, and certification. For a simplified and scored overview, see table 2 in chapter 3, and for a detailed overview of all the collected data, see appendix D.

4.2 Environmental sustainability

4.2.1 Construction

Traditional building *materials* in the Amazonian rainforest are local wood and leaves, but in the hot and humid climate these need frequent maintenance and have a short life span. In the long run, this could mean a stress on the supply of these natural materials that might be difficult for certified and environmentally friendly providers to handle, and too expensive for the ecolodge to afford. In this case, artificial materials could be a better choice.

The use of stone as primary building material at higher altitudes can be a wise decision since stone is impermeable to rain, snow and wind, and can stay warm overnight if the room has been heated during the day. Stone is a natural material that does not give rise to anthropogenic emissions for its production, but is

on the other hand not a renewable material from the perspective of a human's lifecycle. Additionally, if the stone is taken from a new quarry, the environmental impact is much higher due to the land degradation and use of fossil fuels for the machines, than if simply collected at small extent from the surface.

Though long lasting, the environmental impacts of concrete must be taken into account since its production gives rise to considerable greenhouse gas emissions. E.g. the production of concrete in Sweden stood for 5 % of the country's total greenhouse gas emissions in 2005 (McKinsey & Company, 2008). However, the Swedish concrete production should not be compared to that of a developing country such as Ecuador, but the 5 % can provide an image of concrete's global contribution to greenhouse gas emissions. On the other hand, the durability of concrete can save a lot of trees from being used as building material that can be destroyed rapidly for example in the warm and humid climate of a tropical rainforest. The question could be whether those saved trees will take up the amount of greenhouse gases produced by the concrete used as building material in their place.

The Smart Voyager certification criteria (see Appendix D) mention that "the tourism operation should support and promote the conservation of the environment, the protection and correct use of natural resources" and that "the tourism operation should prevent, mitigate and compensate for the environmental damage that they cause to their surroundings". This could mean taking responsibility for all the material bought for the ecolodge, for example by compensating for wood and leaves through reforestation.

But it also includes having to do the calculation concerning whether it is a better investment for the environment and local nature to for example build a bird tower out of metal instead of wood, use manufactured paint instead of natural colors, etc. The impact of the artificial construction materials must be weighed against their, often, longer life span in comparison to natural products. But then again, for bird watchers coming from across the globe to see coveted species in the middle of the canopy it might result in a more genuine experience to be in a watchtower made of natural materials than in a metal tower painted with artificial paint.

Since the basic idea with ecotourism and thereby also ecolodges is, according to the Mohonk agreement's (2000) definition, "sustainable tourism with a natural area focus",

being as environmentally and culturally authentic as possible should be a motto to every ecolodge.

Further, reused materials and materials that can easily be properly recycled at their end-of-life stage should be prioritized. Bellavista's use of a multitude of construction materials expands its obligations to manage every type of material at its end-of-life stage, while Alándaluz, consisting mainly of bamboo, has a single type of biodegradable material to take care of.

Additionally, construction materials should preferably be non-toxic and of local or national origin in order to decrease the environmental impact from transportation.

It could be argued that an ecolodge has higher environmental impact than ecotourism operations not offering accommodation, since buildings come with environmental intrusion, land use change and resource use. But the tourists need to stay somewhere and better then at an ecolodge than at a conventional concrete complex.

The *design* is very important in order to take advantage of the natural conditions as well as to create a harmonious lodge that blends in with its surroundings. Passive design is preferably applied, since it minimizes the need of energy for cooling/heating, ventilation and lighting. Mehta et al. (2002) also recommend looking at the local traditional building designs and choice of materials before setting up an ecolodge, since people, especially natives, have most likely been trying to adapt to the local climate and conditions for generations and developed good skills for it using local natural resources. If an ecolodge is put up in a previously uninhabited area, inspiration could be taken from traditional construction design in climate zones similar to the one in question. However, the design should be based on the natural resources found locally, so that for example palm leaves for roofing do not have to be transported long distance for the sake of the ecolodge to look traditional.

Design can also be applied to the landscape around the buildings. If an ecolodge is to blend in with its natural surroundings, it needs to adapt more than only the design of the buildings. The area around the cabins at Napo Wildlife Center is very tidy and full of beautiful plants and flowers. However, it looks too arranged to be natural and contains flowers that are not indigenous to the area, and thereby makes the lodge stand out more from the surrounding nature. For a more genuine experience of the local natural environment, visitors should not be provided with overly

arranged or non-indigenous plants, however beautiful.

Regarding the second quote from Mehta et al (2002) in section 4.1 above, “artificial commodities” can be invented in alternative ways through a bit of creativity and courage. Raising the comfort level, an ecolodge can meet a higher demand for comfort than the average backpacker, eco- or adventure tourist would have. Black Sheep Inn, for example, can brag about not only having a sauna heated with invasive and non-native wood and a hot tub with water heated by a home made solar thermal collector; they even have a fountain and a water slide with water provided by a solar powered pump. All these luxury commodities are completely unnecessary for a normal living, but since BSI can provide them with minimum negative environmental, social and economic impact, the ecolodge can compete with more comfortable but less sustainable accommodation facilities and attract tourists beyond the average ecotourist. This could very well help spread the concept of ecolodges and have people not usually thinking in terms of sustainability to open their eyes to the multitude of opportunities and advantages. Also, it can show conventional tourism operations how to implement more sustainable features and solutions without necessarily changing their business as such.

4.2.2 Water

Regarding *water source*, an ecolodge’s resilience increases with each additional source. Dividing the demand over several sources decreases the pressure on each source. Three of the case studies solely or mainly rely on groundwater, but are located in areas where drought is rare and agriculture is not heavy. The natural conditions imply that the risk of the groundwater level getting too low is small, but for ecolodges in drier areas it might be of higher importance to conserve the water source itself by making sure it is not over-exploited.

BSI has spread its need over four different sources and of varying types, while Alándaluz relies on the municipal water system. This might feel safer than having their own well since there is a dry period from October to January, but restrictions can be applied to the water use and scarcity can strike the entire community. A groundwater well of their own would probably risk saltwater intrusion so close to the ocean, and rainwater harvesting would not provide water sufficiently and regularly enough. However, it



Figure 8. The water-saturated páramo around Polylepis Lodge provides easily accessible water in abundance.

might be an option for them to look for groundwater at Cantalapiedra just in case of a drought.

Only two of the case studies had several sources, but for example for Polylepis it might not be necessary with more than one water source since the soil is constantly saturated on the páramo (see figure 8). However, having an alternative would be good even in this case, considering for example possible jurisdictional alterations, competition from other lodges, and changes in precipitation and temperature due to climate change, and its possible effects on the páramo as water source.

Surface sources, which Polylepis and NWC rely on, are more vulnerable to seasonal weather variations, air pollution, and climate change, but in the Amazon and up on the Andean páramo surface sources seem quite reliable year round and less prone to pollution since there is no dense built-up area nearby.

The above examples boil down to a strong support of the idea of basing the design of an ecolodge on the natural conditions and local climate at the lodge’s position.

Potable water from the tap has the advantage of being produced locally and not transported long distances by fossil fuelled vehicles, which is often the case for bottled

water. Of course the health of the visiting guests must be of high priority for the lodge to keep its business, but locally sourced and treated water may be as good as imported mineral water. The kind of treatment necessary and the most environmentally efficient alternative need to be chosen. The purifier used at BSI for cleaning potable water with ozone is quite small, uses only small amounts of electricity and works in practically any climate. It could therefore be an alternative to consider for the other case studies, so that they can stop buying and transporting bottled water, and thereby save money and spare the environment.

According to Mehta et al. (2002), less than 10-15 % of the water a lodge purifies is actually used for drinking. This means lodges spend exceeding amounts of energy and money on raising the water quality to drinking level even if it is used for purposes such as watering or toilet flushing. An ecolodge should therefore try to adapt the amount of water purified to foreseen drinking needs, and not purify water in that sense for purposes of lower quality needs.

To have the tourists trustingly drinking the treated local water can be a challenge, but tricking them into believing it is imported mineral water is not a sustainable version since it degrades the lodge's credibility. Tourists might wonder if any container actually contains what the label says, and it is never attractive to feel fooled on your money's worth.

For the sake of *water conservation*, it was surprising to find that only one of the case studies used dry composting toilets. Since composting toilets do not consume fresh water, do not produce black wastewater, and provide good fertilizer, they certainly fit the ecolodge idea of over-all sustainability. According to Mehta et al. (2002) "composting toilets offer one of the simplest and most economic ways to prevent pollution by converting excreta into fertilizer." Therefore, the composting toilets at Black Sheep Inn are a winning concept in many ways (see figure 9).

So why do not more of the case studies use them? A natural answer could be because of the assumed smell, but the visits to BSI's composting toilets did not prove disturbing at all. Instead soothing to the mind with the flourishing flowerbed inside the bathroom and the magnificent view over the Andes through the large window. However, in those cases authorities do not allow composting toilets in tourist accommodations an alternative to the

composting toilet is necessary. Another possible obstacle is customer demand. Alándaluz was originally built with dry toilets in each cabin, but due to the financial crisis in Ecuador in the late 1990s, most of them were changed into ordinary WCs. Less international tourists were arriving, but more Ecuadorians were travelling domestically, and they seemed to expect not having to use composting outhouses on their vacation. So in order to meet the demand, Alándaluz chose to implement the conventional water flushing toilets they still use today.

The other case studies, excluding BSI, did not even seem to have considered the idea of keeping composting toilets. A guess is that it is because tourists are expected to want the luxury of a WC since composting toilets are seen as undeveloped, dirty and smelly. Another option is that they want to attract the kind of tourists that seek adventure but without having to compromise their habits or comfort standards too much.

A question is if composting toilets would be insufficiently hygienic with increased risk of infection in warmer and more humid areas such as the rainforest, cloud forest and the coast, and that that is a reason not to have them in these types of climate zones? Or would the demand increase successively anyway if the supply shifted into a majority of composting rather than water toilets, and tourists were simultaneously informed of the many benefits of well-kept composting toilets?



Figure 9. Inside one of the restrooms with composting toilets at Black Sheep Inn. Notice the sink that receives its water from a barrel with harvested rainwater on the roof of the building. Biodegradable soap is provided next to the sink and the grey water is directly transported to the indoor flowerbed; all made clearly visible to the visitor. Information on how the composting toilet works and its many advantages are posted on the wall next to the seat.

Not *monitoring* the water consumption makes it difficult for a lodge to get a perception of how much water is actually used. Neither can any progress be measured. The need to monitor the consumption of water and energy, and the production of waste and pollutants, should be obvious to an ecolodge. However, as noticed at one of the case studies, installing a meter is not always possible, but efforts should be made to retrieve some kind of appreciation of consumption and the effects of possible alterations to the system.

It was interesting to see the differences in water consumption per person that were revealed due to monitoring at some case studies. Having these figures enables comparison and expansion of perspective on what is normal to an ecolodge and which level of water consumption could be accepted or should be encouraged.

Regarding *water harvesting*, it is a simple measure for water conservation as long as the surface the water is collected from is relatively clean, sheltered from external pollution, made of non-toxic material, and the water is adequately treated before reuse. The collected water can be used for various purposes such as showering, washing, machinery, flushing toilets, or perhaps even for drinking. The soil is not bereaved of the collected water since there are no plants needing it where the collecting building or barrel stands. Rain harvesting might even prevent soil erosion since the amount of precipitation and therefore surface run-off is somewhat decreased.

None of the case studies are located in an area normally affected by severe or long-term drought. The expansion of precipitation harvesting at the case studies could therefore be considerable, also from an economic and practical perspective since implementation can be simple and cheap. The ecolodges would be supplied with free water, needing light, if any, treatment before being reused for a number of purposes. Power for running pumps or receiving water from the municipal system would not be necessary. Neither would any groundwater levels risk being affected as long as the collected water is not transported away from the area after final use. Ecolodges in water abundant areas such as cloud forests, rainforests and highland páramo should definitely consider implementing rain harvesting, while it might be an effort that never pays off for ecolodges situated in drier areas.

The only difficulty of rainwater harvesting noticed at the case studies was at Alándaluz, where salty fog and spray from the ocean is

constantly reaching the lodge. Seawater intrusion could disturb or even impede water harvesting unless the system can cope with the salt, the water can be easily desalinated, or the water does not need to be fresh. Plants should not be watered with saltwater since it ruins the soil, but the harvested brackish water could still be used for toilet flushing and hand washing as long as the treatment system can manage it.

Reuse of water was in general surprisingly absent at the case studies. Mehta et al. (2002) emphasize its importance by saying that “water reuse should be standard in the industry and a very high priority for designers”.

With increasing population and climate changes, clean freshwater can become a scarcity in more places than today. For an environmentally, socially and economically sustainable ecolodge reuse of water should be as obvious as generally implemented in the business. Harvested rainwater could be used for hand washing and then that water could, if not watering plants, be used for toilet flushing for WCs. Grey water from kitchens, showers and sinks could be treated and reused for, for example, watering of the lodge’s vegetable patches or neighboring farmers’ fields. Only adding biodegradable cleaning products and soaps facilitates treatment of rainwater before reuse, if necessary, and facilitates the final treatment of wastewater.

An ecolodge should not only look to its own water needs and rely on natural processes to replenish the municipal supply. Climate change might alter precipitation patterns and the municipality is most likely to be affected by global economy and its potential fluctuations, making a dependent ecolodge unsustainable over long-term periods. An ecolodge should also see itself as a part of a larger system, as an organism in an ecosystem, and therefore not detach itself from the needs of the rest of the local community. For example, if the community will grow there will be less water for all, including the ecolodge.

Wastewater treatment should be a top priority for the sake of an ecolodge’s direct environmental impact and appeared to be commonly implemented at the case studies. What kind of treatment system that is needed depends on what types of wastewater a lodge produces. For example, if the case study that had a swimming pool puts chlorine in the water to

keep it hygienic, it also needs to be prepared to manage the pool's chlorinated wastewater.

The case studies show that there is a large number of treatment systems of various complexity to choose from to make sure the estimated amount of produced wastewater, accurate treatment for the expected contents, surrounding environment, and so on is accounted for. Black and grey wastewater might require different kinds of treatment due to the different substances dissolved in the wastewater, but there are systems that can manage treatment of both types simultaneously, as seen at Polylepis Lodge.

What kind of maintenance it requires is necessary to know for the long-term budget, for example the cost of emptying the system of sludge or gas. The cost of random sample testing of the outgoing treated wastewater should also be included in the calculations. If the treatment system needs emptying of sludge or gas, the environmental costs of accessibility and impact of possible collecting vehicles also has to be considered.

It was interesting to find that a Smart Voyager auditor had noticed the failing water treatment system at one of the case studies and had demanded that it be taken care of. This shows the type of potential positive effects a certification can have on a tourism business. Follow-up audits are, however, crucial for continuous quality assurance.

4.2.3 Energy

The ultimate ecolodge could be seen as one only using energy from its own sustainable and renewable sources. Backpackers and adventure tourists could be more likely to feel comfortable without electric appliances than the majority of the clientele – which is also ready to pay more for comfort and might require higher standards. For example in the Amazon, where the climate is hot and humid and it is dark by 7 pm, solutions are needed for cooling, lighting, cooking, etc. It can however come in different versions, such as electricity from a generator, heat from gas or wood combustion, or through climate adaptation by building design.

Choosing sustainable and renewable *energy sources* should be evident to an ecolodge. Information about the sources of the nationally produced energy is necessary, together with knowledge about renewable sources such as

solar cells and heaters, biogas and wood from non-native, non-threatened species.

Maquipucuna's idea on starting their own biogas production from biological waste from their organic vegetable garden was unique among the case studies. The produced biogas would be used to fuel a stove to begin with and perhaps even a moped, but if the production proved successful a future expansion seemed likely. Biogas could replace the fossil natural gas commonly used among the case studies in kitchens and for providing hot tap water. The fossil gas bought in 25-30 kg cans has also been transported longer distances and therefore gives rise to even more greenhouse gas emissions than those produced at its combustion.

Another good example of environmentally friendly energy sources is Black Sheep Inn's use of wood from non-native eucalyptus trees. Some trees were brought to Ecuador decades ago and have spread rapidly, Andres Hammerman said. Their leaves contain substances that are toxic to many other plants and therefore ruin the soil for native species. In order to protect the native flora, BSI only uses locally cut eucalyptus for its wood burners that provide the heating of the lodge buildings.

Polylepis chose to get connected to the national grid by having power lines drawn into the valley. Since clouds normally cover the valley most of the day, solar power did not seem like a financially wise alternative. Wind power could have been a better idea since the plains and rolling hills surrounding the valley are seldom calm, but then the value of the relatively untouched nature – what attracts tourists in the first place – could have decreased. The possible disturbing effect on birds and bats would also have to be investigated. Yet, the cables mounted on large towers bringing electricity to the valley could also be seen as an eyesore. A question is if tourists would be more bothered by the visual impact of suspended electric cables than that of wind turbines.

Further, wind turbines would make Polylepis independent of fossil fuels as well as possible future governmental decisions regarding change of energy sources and imports. A positive effect of getting connected to the grid lines, however, was that the lodge could get rid of its diesel generator.

Diesel generators should only be used when all other power sources have failed, but can be a reliable back-up plan in a remote location. However, it was surprising to experience both the sound and air pollution the large diesel

generators at NWC create, and the amount of energy needed to have them running. Using up m^3 after m^3 of fossil fuel each month is neither sustainable nor environmentally friendly, and using these kinds of generators as the main power source should be strongly avoided by an ecolodge. According to manager Fausto Cornejo, another 16-20 solar panels (8-10 m^2) are needed together with 38 more batteries to cover the electricity produced by the generators. One solar panel costs around US\$ 120-600 (960-4,800 SEK) and one battery costs about US\$ 1,200-2,000 (9,600-16,000 SEK), which means that Napo Wildlife Center would need up to US\$ 88,000 (704,000 SEK) to be completely independent of fossil fuels, he says. It will take NWC quite some time to afford the full set of panels and batteries since their annual profit is smaller than US\$ 88,000 and other projects that also require funding have higher priority. However, a complete set of solar panels would also mean the lodge would not have to spend money regularly on new diesel. A possibility for the community would be to borrow the money needed for the solar panels from a bank, as long as the interest is lower than the cost for diesel, but the Añangu prefer to look for an NGO or other non-profit organization to help them with the financing.

Seemingly, the most important energy aspects for a sustainable ecolodge would be, if not to use any produced energy at all, then at least to be independent of fossil fuels and spread the demand over several renewable sources such as wind turbines, solar panels and biogas. An ecolodge can thereby increase its resilience in case of energy scarcity, augmented demand, or failure of a power source. To be independent of the general grid is even more important in countries where most electricity is produced using fossil fuels.

Since an ecolodge is likely to be located in a natural area, the national power grid – if existing – might not be within reach. An ecolodge being set up should therefore be ready to look for other sources of electricity, and thereby have the chance to better influence the sustainability of what it runs on. The ecolodge's choice of energy sources should be based on the surrounding scenery and prevailing climate. As mentioned, electricity-generating solar cells were destroyed by the ocean spray at coastal Alándaluz, did not function sufficiently in the cloud forest and might not be enough for Polylepis in the cloudy highlands either. But they seem optimal to the

case studies in the rainforest and probably to ecolodges in semi-arid and desert areas as well.

Energy conservation is still important even if a lodge relies fully on sustainable energy sources. Conserving energy results in lower operational costs, less material use and reduced environmental impact, as well as a strengthened image to visitors.

All the case studies use energy-saving light bulbs to some extent, but a few believe that conventional light bulbs are better suited for outdoor lighting conditions. For this type of situation, LED lights connected to a small photovoltaic system could be a more energy-conserving alternative. LED lights are durable, do not spoil night vision, hardly produce any excess heat and are not disturbing to wildlife. And with 0.07 W they can be quite cost efficient and use much less electricity than conventional incandescent 60-100 W light bulbs.

Choosing energy saving equipment and machines is of course as important as energy-saving light bulbs. If for example a refrigerator and freezer are necessary to procure, models that are certified or marked energy saving should be chosen over other models.

Most of the modern metal canoes used mainly to transport tourists on the Amazonian waterways have four-stroke engines, but a few have two-stroke engines, which pollute considerably more due to gas leakage directly into the water and a relatively higher fuel consumption. This is a perfect example of where environmentally hazardous models should be exchanged for more environmentally friendly newer types. The only obstacle for an upgrade should be money, but in situations like this where the differences in impact between old and new versions are so considerable, an upgrade should be prioritized in the budget.

The washing service NWC offers their guests can be a way of providing a more luxurious impression and does not necessarily have to increase the lodge's energy, water or detergent use considerably if the machines would run anyway and the extra laundry would be limited. However, the washing machines might be running this often if the linens and towels are washed daily. An ecolodge should make clear to its guests that their bed sheets and towels will not be washed for the duration of their stay, unless specifically asked. Washing these textiles daily is a great waste of energy, freshwater and detergent and is normally not necessary for hygienic purposes.

In comparison to the washing that is done by hand at Sani Lodge, washing machines are likely to manage more textiles faster, use less water, and portion detergent more efficiently. But at Sani, two job opportunities are created and no electricity is used in an area where electricity is scarce and water is abundant. However, the treatment of the wastewater from Sani's hand washing was not inspected but the water should be detained until treated correctly to minimize leakage and environmental impact.

Energy conservation can also involve creating routines for the staff so they can primarily learn why and how to keep energy consumption down themselves, and secondarily to teach visitors about the benefits of energy conservation. When giving a welcome speech, most lodges asked their guests to use energy and water sparsely.

Being connected to the grid means using power someone else could have used instead. So, by being disconnected and installing a private sustainable energy system, national energy conservation is done and less energy needs to be imported. However, if the nation the ecolodge is situated in mainly produces energy from fossil fuels, importing energy from a different country might be a better alternative if that energy comes from renewable sources.

An ecolodge should *monitor* its consumption of all kinds of energy used, so that the figures are known and any progress or negative development of conservation measures can be acknowledged.

When analyzing the maximum number of guests the four lodges of NWC, Alándaluz, Maquipucuna and Bellavista can accommodate, it is interesting to see the variation of amount of electricity consumed at each lodge (see Appendix C). However, an ecolodge should not only keep track of its electricity consumption but of all the fuels and energy sources it uses. If it is difficult to install meters, receipts of for example gas tank purchases could be listed for an overview of amounts consumed during which intervals. This type of information can also serve a purpose when comparing the operation to other competitive lodges and for making statistical analysis of ecolodges possible on a larger scale.

4.2.4 Food

The food bought and served by an ecolodge should have the smallest negative effect possible on the environment, not only for the sake of the

environment but also in order to make a statement to visitors and local inhabitants. Therefore, one could expect an ecolodge to serve locally and organically grown food to as large extent as possible. Vegetarian food should be the norm and serving meat should be the exception, due to the vast environmental impact of livestock (Steinfeld et al., 2006).

Black Sheep Inn successfully runs an all-vegetarian ecolodge, posting their choice of diet on their homepage and explaining to their guests why they have chosen it. There should be nothing keeping other remote lodges, such as the case studies in the Amazon, from choosing less environmentally harmful diets and dishes even if they cannot grow food locally themselves. If choosing to serve meat anyway, it should not be served every day and white meat should be prioritized over red. Though caution needs to be taken considering the potential health hazards of meat and dairy produced from animals infected with for instance tuberculosis, salmonella and trichinosis.

There should neither be any unnecessary waste, and the leftovers and inedible parts that are discarded should be used for compost, animal feed, and similar. Alándaluz is the only case study with an open restaurant where guests can pick the meal of their choice from a menu. This means that all the ingredients needed for every dish on the menu need to be readily available in the restaurant kitchen every day. Although most of the ingredients are locally produced, it is still a large quantity and diversity of products that constantly need to be gathered, managed and kept fresh. It is also imaginable that this system results in larger amounts of produced waste. All the other case studies instead serve the same dish to all their guests and on fixed hours. This facilitates planning and procurement, and decreases resource use and waste production, especially for the remote lodges in the rainforest.

An ecolodge should also support local farmers and grocers as much as possible by buying groceries from them. As an important client, the ecolodge could put pressure on the farmers to grow organically, monitor their water use, keep good quality, not use children for labor, have legal working conditions, and so on. Employment in the area could be strengthened, while unnecessarily long transportations of groceries would be avoided.

Marcelo Vinuesa's vision is to have as much as possible of Alándaluz's food produced at the lodge's reserve Cantalapedra, and the rest

bought from local farmers. Also, farmers from all over Ecuador have come to Cantalapiedra to learn how to practice organic agriculture. The ambition to have all the food produced locally goes very well with environmental and social sustainability, but the lodge also has the largest guest potential of all the case studies and a restaurant that not only guests are welcome to. The menu is extensive, which means that a large stock is necessary, something the other lodges avoid by only serving one kind of three course meal per occasion.

Every lodge needs to acquire food and land has to be occupied for its production. It would be better for the environment if this land was placed in the lodge's vicinity and farmed organically, in order to cut the negative impacts of transportation, artificial fertilizer and pesticides. But the question is if the environment would still benefit from local produce if for example rainforest had to be cleared for this reason? If it would be beneficial, an idea is to include in the ecolodge concept that an ecolodge has a given rough number of hectares of cultivated land per guest in order to produce food locally – unless it is possible to buy enough groceries from local organic farmers.

4.2.5 Waste

It is a challenge for a tourist accommodation facility, intending to provide full service, to not create any waste. The waste produced can be of many different kinds, each needing different ways of treatment; solid, liquid, organic, inorganic, recyclable, non-recyclable, etc. But there are many things that can be done to decrease waste production and make sure the waste produced is taken care of in a sustainable way.

Waste minimization should be well integrated in the daily practices of an ecolodge, in order to prevent the production of waste that requires resources for further management, and especially the production of waste that cannot be recycled or reused. Mehta et al. (2002) give the advice of being critical when purchasing products, and to look at their packaging, content, and how they can be reused or recycled after use before deciding on buying the product.

Products with toxic content should be avoided as much as possible and the more products produced onsite, the less packaging to discard.

Waste separation occurred at very various extent at the different case studies and extensive separation did not seem to be standardized or a legal obligation in Ecuador. Only at one case study did the manager's idea of waste separation not correspond to the actual routines of the staff. This could be rectified with information and training, together with monitoring of the production of the different waste fractions.

Sani Lodge has a wastebasket in each cabin for organic waste, such as used toilet paper and food scrap. An idea, probably applicable to NWC and other lodges, is not to put that organic waste into the septic tanks but to use it for local biogas production. Since the national grid is out of reach that far into the rainforest, any kind of environmentally friendly energy source should be welcome. Perhaps the lodge could gather organic waste from the whole community to produce biogas both for the lodge and for collective use. The gas could then fuel the boats needed to go up the river to the larger society where tourists are picked up and dropped off, and all the lodge's groceries and materials are bought. To give back to the local community, a portion of the biogas could also fuel a boat that could operate as communal transportation vehicle and as a school bus for older children that attend school in the city.

Maquipucuna had at the time of visit plans on constructing their own biogas facility with organic waste from the kitchen and the vegetable garden. Also being located relatively close to a community, they could ask to gather all the community's organic waste and produce more biogas of which a share could go back to the community.

A question that arose during the visits was whether to put used toilet paper into the compost or not. The risk of transferring harmful bacteria and medical substances via the mulch or slurry on to plants grown for food seemed too large for some lodges to accept while others deemed it safe. The fact that lodge visitors come from all continents means bacterial input from a larger spectrum, but it comes down to how well the compost, biodegrader or biogas facility manages that bacteria. Further research and information on this topic would be useful to ecolodges worldwide.

Only the imagination sets the limits for how the other separated waste can be used. BSI has found a purpose for used glass bottles as building material and has integrated hundreds of bottles into the walls of bathrooms and showers. This lowers the production, transportation and end-of-

life management of concrete and window glass, and allows for natural lighting while the view from the outside is obscured.

Monitoring the waste production should be standard for an ecolodge. A suggestion could be that an ecolodge weighs its waste after it has been separated into the different fractions. This way, there is no confusion about how much waste is produced of the different types and it is easier to see how much actually ends up in a landfill and how much that is recycled or reused.

The ecolodge could also see how much waste is produced per guest; a number that can be used when comparing with other ecolodges no matter the capacity.

Of the case studies that did measure their waste, it was striking to see the differences in amounts produced. Though it might be because the numbers do not represent the same thing. BSI's 0.08 kg per guest per night might be the non-recyclable waste left after separation, while Bellavista's figure of 0.4 kg per guest per night might be their total amount of produced waste. However, NWC's digit of over 800 kg of waste on average per month (compared to 23 kg per month from BSI and 233 kg per month from Bellavista) seems curious considering their guest capacity is relatively similar to both BSI's and Bellavista's. This confusion also indicates the value of keeping proper records of the volumes produced of which fractions so that comparison and statistic analysis can be performed accurately.

The case studies that did not measure their waste production did not seem to be aware of the possibility or how to do it. If informed better and shown the advantages, more of them could begin keeping track of their waste production and separation.

Waste management in Ecuador seemed to be a major problem during the visit to the country, due to a lack of an official, national, functioning waste treatment program and multi-functional facilities. There was some collecting of recyclable waste by private companies in Quito and other major cities, but in the countryside, where most ecolodges are located, the system appeared dysfunctional if at all present. Therefore, in countries with similar conditions or worse, the pressure is higher on ecolodges to manage their waste themselves. If the waste is handed over to the municipality or a private waste management company, it is taken out of sight of managers and staff, and management

responsibility for it is thereby easy to neglect. An ecolodge should be ready to take care of its own waste to as large extent as possible, unless a controlled local waste management system is available.

It would also be interesting to find out if the environmental impact would be smaller from putting the waste produced by the Amazonian case studies in a landfill in Coca than transporting it by plane to a waste management company in Quito.

It was interesting to find that a few case studies applied producer responsibility to some of their waste and could return emptied containers to their producers instead of passing them on to the local waste management companies. Returning empty containers to the producer of the commodity implies a (semi-) closed material loop instead of the linear consumption system that is sadly the norm in Western societies.

The recycling center supported by BSI enables transparency of the treatment of BSI's waste, shortens the distance the waste is transported, allows for the locals to reuse and recycle materials that are expensive to buy first hand, and provides a few jobs. This is a good example of extensive sustainability thinking, especially since BSI's goal is to teach enough local inhabitants for the community to keep running the recycling center on their own.

Unfortunately, the co-manager of BSI says that he used to go and work with the recyclers every week, but after visiting more rarely he has found that the locals working at the center are throwing increasing amounts directly into the landfill instead of classifying and separating the waste as he had taught them. On the other hand, school children from around the area get involved on special waste management days, and learn why and how to separate waste. These children can then hopefully spread that knowledge on to their parents and the community, increasing the pressure on the recyclers to stay informed and keep improving the waste management.

4.3 Socioeconomic sustainability

Stern et al. (2003) mention employment, infrastructure development and improved business for local stores as some examples of the positive local economic effects an ecotourism business could have, paired with low-impact and sustainable resource use. All these factors could

also mean improved social conditions, such as better family economy, facilitated transportation and a healthier environment.

This aspect is safeguarded as a principle included in the Smart Voyager certification, stating that “the tourism operation should improve the socioeconomic welfare and the quality of life of the workers and their families.” (Principle 5, “Just and fair treatment of workers”. See appendix D)

Stern et al. (2003) also point out the fact that a sustainably managed natural environment can be worth more than exploitation of natural resources. As an example, the financial value per hectare of land in a national park was found to be 50 times higher if used for tourism than if used for agriculture (study on Amboseli National Park cited by Ceballos-Lascuráin (1996) in Stern et al., 2003). However, a question from an ecolodge concept perspective is then if this is valid in every country or only in developing countries where agricultural products are priced low but people from developed countries spend a lot of money as tourists. To take into consideration is also the risk of overflowing the national park with more tourists than the ecosystem can handle. Though this could, hopefully, be reversed more easily than if trying to get the national park back from heavily exploited agricultural land.

Other positive local economic impacts an ecolodge can contribute with are the increased number of tourists paying entrance fee to a reserve and thereby supporting the reserve financially. If the area visited is not protected yet, this kind of financial support and increased visitor rates could help it in becoming so. (Stern et al., 2003) Several of the case studies were doing things similar to this. Napo Wildlife Center and Sani Lodge help bringing in entrance fees to Yasuni National Park using the nearby parrot claylicks, and the Maquipucuna foundation has bought increasing amounts of land, partially financed through their lodge business, to create a private reserve in a biodiversity hotspot that can be connected to other nature reserves making up a wide, protected corridor stretching across half the country.

For Alándaluz co-owner Marcelo Vinueza, it is also an important economic sustainability aspect that his ecolodge has evolved without any financial aid from non-profit organizations, governments or other third party, since receiving help would mean to him that the lodge is not self-sufficient and thereby unsustainable.

An ecolodge should also include profitability in terms of economic balance over time. An ecolodge would not be sustainable if, for example, it would go bankrupt. Profitability as a socioeconomic sustainability aspect was considered for this thesis but speaking of money appeared to be a delicate cultural obstacle. Therefore, instead of acquiring few, if any, data, profitability was not brought up as an aspect during the visits, but should be included in the ecolodge concept.

For a simplified and scored overview of the case studies' sustainability indicators, see table 2 in chapter 3. For a detailed overview of all the collected data, see appendix D.

4.3.1 Staff

Local inhabitants should be hired for all positions possible for an ecolodge to contribute to socioeconomic sustainability. Salaries will then function as community investments, instead of disappearing through transactions by foreign employees. If the hired locals can support their families properly, they could also afford letting their children attend school. This creates a long-term support for the individuals as well as the community as a whole since increased education levels can lead to poverty alleviation, increased gender equality, improved health, etc.

In return, locals can supply the best knowledge of the surrounding geographical area, customs and traditions, flora and fauna, services and communications, etc., which can help the ecolodge in its operation and its guests to a more fulfilling visit.

However, Lindberg et al. (1996, cited in Stern et al., 2003) bring forth a general worry that ecotourism provides relatively few work opportunities. They find that the tourism business brings an unreliable source of income that is affected by seasonal variations, international politics and global economic fluctuations. This means that an ecolodge operation should take into account the insecurity of employment possibilities and for example create a backup fund for low seasons and times of global economic regression to care for their employees.

Salaries were difficult to find data on and therefore to come to any conclusions about. The times when the question was asked an answer was not necessarily provided, and the few answers given were whispered. Perhaps the employees felt they could not freely discuss their

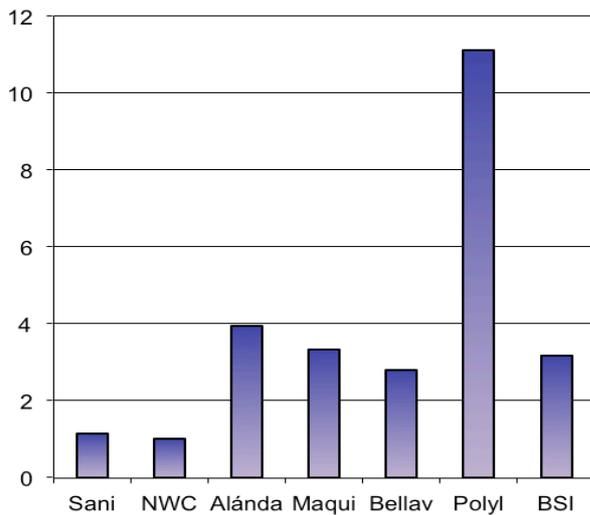


Figure 10. Amount of guests per staff member at the visited case studies, when fully occupied and with maximum members of staff on duty. Average (excluding Polylepis) is 2.6 guests per staff member.

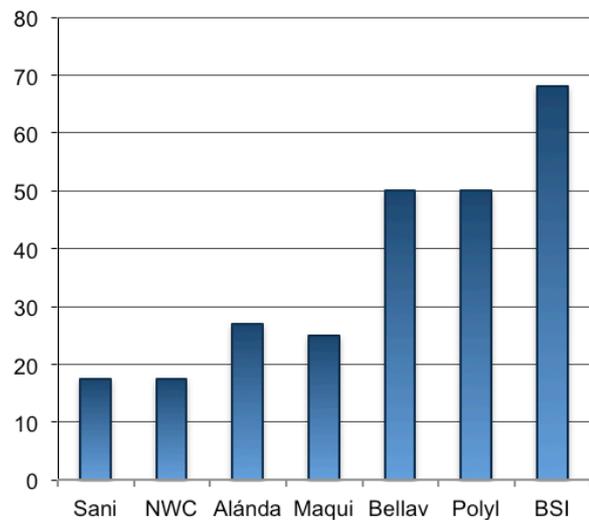


Figure 11. Percent of staff at the case studies that are women. Average is 36.4 %.

pay without risking their job, or it could be a cultural matter not to discuss money. Either way, an ecolodge should provide responsible work contracts, fair salaries and encourage forming of workers' unions, especially in countries where something equivalent is not custom. Hopefully, workers' rights and safer employment contracts can then spread to other business sectors and improve social sustainability and fair salaries even outside the ecolodge sphere.

An ecolodge should also offer fair *working conditions* for both men and women. The working conditions at the case studies appeared safe and well regulated. Conditions for periods of work and time off seemed clearly stated and known to staff members. No member of staff appeared unsatisfied with their work schedule and amount of consecutive working hours, but cultural reasons could be an obstacle for finding true opinions on this topic.

Sustainable working conditions also mean staff members should have a manageable workload. One way to check this could be to calculate the amount of guests per staff member based both on the average conditions and on when the lodge is fully booked and maximum number of staff is onsite. An acceptable quota could be discussed between staff members at different ecolodges, but a comparison between the case studies shows that the Amazon lodges have the lowest number of guests per staff and Polylepis has the highest (see figure 10).

The average number of guests per staff member is 2.6 (excluding Polylepis), while Polylepis has 11.1 guests per staff member. For a lodge like Polylepis, with a capacity of 50 guests and sometimes up to 90 guests at daytime (20 guests per staff member), it seems insufficient and straining on the staff members to have only between 2 and 4.5 full-time employees on duty.

On average over the year none of the lodges are fully booked, but it occurs regularly, especially during high season. Figure 1 shows the differences in planning for occasions like these, and should be part of an ecolodge's resilience.

The Smart Voyager certification scheme has another principle regarding staff, which says that "All of the personnel involved with the tourism operation should receive continuous education and training in topics of sustainable tourism, the environment and social issues in accordance with the duties of each employee in order to reduce the possibility of generating negative impacts" (principle 6, "Personnel training". See appendix D). If included in the ecolodge concept, fair working conditions could then also involve education and personal development.

Staff housing were never visited on the inside, except at NWC, and only pointed out from a distance at the case studies that offered housing for staff. Providing suitable accommodation with opportunity for relaxation out of sight of visitors should be apparent to an

ecolodge that takes care of its staff members and wants to facilitate for them to do a good job.

The several weeks long working sessions at some case studies mean staff has to be away from their families. If the ecolodge is very remotely located, having more but shorter breaks might not be useful to the employees since travelling home and back to the lodge would take up too much of the time off. Another alternative could be to allow the families of the employees to come stay at the lodge, but if there would have to be room for whole families for each employee the ecolodge would turn into a small society and lose its niche as non-intrusive and relatively secluded small-scale business.

Regarding *gender equality*, the differences in per cent of female employees at the visited ecolodges (see figure 11) is probably due to culture and local traditions, rather than directly discriminatory selection. It is worth noticing that the two case studies with solely foreign owners (Bellavista and Black Sheep Inn) show among the highest percentages of female staff (50 % and 68 % respectively), while the two case studies owned and run by local native tribes show the lowest rates (17.5 % on average).

Chores also showed to be divided between genders at most case studies. For example, it is mainly men who work at the rainforest lodges since the women stay at home and take care of the family household and children. NWC's manager Fausto Cornejo said that he had tried to encourage local women to come work at the lodge, but that the majority kept choosing not to. However, the community had voted for both sexes to be allowed work at the lodge so if more women would become interested they would be welcomed.

It was also striking to see such a strong majority of all the guides being male. Guiding should have nothing to do with gender related features, but the unequal division could most probably be due to cultural reasons. The British owner of Bellavista had no trouble employing women as guides, and the American couple of BSI encouraged local women to learn how to guide tourists so that they could receive their own income, which could then also strengthen their self-esteem and independency.

Of course, gender-neutral employment could be an ambition of the ecolodge, but if the order comes from a non-local or foreign manager, there is a risk of making the locals feel their traditions are ignored. At the same time,

maybe traditions should be challenged if they are oppressive or discriminatory? Culture and traditions are sensitive subjects and one needs to be aware of the local habits and priorities at every ecolodge location in order to tread lightly and assure a positive relationship with the local community.

4.3.2 Local community

Stern et al. (2003) highlight that it is important that local inhabitants get involved in the management of an ecotourism business in order to increase its contribution to the local economy. This is easily done at Sani Lodge and Napo Wildlife Center since the local tribes own both the lodges and the surrounding land. All revenue from the lodges goes back to the community as salaries and investments such as a school, a community assembly hall and a health clinic. NWC has decided that 50 % of the lodge's profit goes to health care and education for the community and 50 % will go to new projects such as a greenhouse with medicinal plants for educational purpose.

But for lodges that are not run by a local group or community, it is important to employ local inhabitants or let them be involved in the decision-making of the lodge's operation, if possible. The Smart Voyager certification has a principle that extends the tourism operation's responsibility to involve not only economic support but also social development: "There should be an active commitment on the part of the tourism operation to search for and promote the welfare of the local communities where tourism activities take place. Participative strategies for development should be established between the tourism operation and the community." (Principle 7; see appendix D)

Black Sheep Inn is a good example in this sense since they almost solely hire locals, take part in community planning, support local education, have helped start a library and both built a local recycling center and taught local inhabitants how to run it. Of course it can be a thin line between supporting the community in what they want to achieve and telling them what they want to achieve. But in for example a rural village in a developing country where children do not get any education, people are poor and women are without rights, an external push in a literate and more gender-equal direction could be progressive.

If an ecolodge is set up, gets involved with the local community and they start projects

together, it would also be preferable if these projects could run over long periods, or at least until the community members have learned to keep them running by themselves, at least regarding economy, time and knowledge. Otherwise the ecolodge could add social and economic entropy to the local community instead of supporting its socioeconomic development sustainably.

Another positive impact by ecotourism on the local economy that Stern et al. (2003) mention is that ecotourists get closer to local markets and stores and can thereby support the local economy and help improve the wellbeing of local families. Examples of this are seen at most of the case studies through the selling of local handicraft. In the rainforest, jewelry made from local seeds by the tribeswomen was neatly exposed on a wall in the common room. Visitors of NWC were also shown to a newly built handicraft center where tribeswomen were showing how they make the commodities and the tourists could shake hands with the creator of the piece of jewelry they bought. This could be seen as a positive type of cultural exchange, but Stern et al. (2003) warn that it could also mean a “‘commodification’ of culture” and that ecotourists are no different than mass tourists in this sense.

In the article “How ‘eco’ is ecotourism?” Stern et al. (2003) compare four communities that are involved in ecotourism. Some positive effects ecotourism has had on the communities are improved economy and better opportunities for education. The economic situation and possible changes at the case studies were not thoroughly investigated for this thesis, but positive effects were noticed in the shape of increased sales of local handicraft at most of the case studies. Educational improvements were easier to see, for example with the rainforest lodges and their newly built school, and with the volunteer program of Alándaluz that facilitates for both Ecuadorian and foreign young people to come and teach at the local school and run interest groups for local teenagers in their spare time. This increases both the language and social education of the local children since they learn a second global language while getting the opportunity to meet people from all over the world, learn more about the home countries of the volunteers, and thereby expand their perspective on the world.

What the study by Stern et al. (2003) finds as negative effects of ecotourism are increased amounts of waste generated, easier access to

drugs and alcohol, loss of culture, and disintegration of both community and families. Tourists can become more interesting than family and neighbors when they are the main source of income and associated with great economic potential. Black Sheep Inn has an interesting way of fighting this through their broad and honest involvement in the good of the local community. By helping to start a library and building a recycling center, BSI can support the community members in feeling proud of how their village is developing and take the focus away from the tourists as the primary source of direct benefit. Regarding the risk of increased waste generation, an ecolodge should keep track of this and provide adequate waste management.

In case the local community grows tired of the never-ending stream of tourists and turns negative to their presence and its impacts, the ecolodge should consider altering its operation or maybe even close down unless that would harm the community. Though a dedicated ecolodge would never try to attract so many tourists that this situation would occur.

4.3.3 Tourist education

As mentioned in section 4.2.3, educating the staff and creating practices can be useful both so that staff members can learn why and how to perform environmentally friendly practices themselves, and to teach visitors about the benefits of these practices. Different types of interpretation, such as video, audio and sensory methods, should be used in an active way so that the most guests can learn as much as possible. Active education includes for example guided hikes, quizzes and cooking of local food where the tourists take an active part in the preparations. Passive education would include informational signs and pamphlets, which the tourists might not notice or even read (see figure 13). Also, passive education does not include checking if the tourists actually understand, which is easier discovered by a partaking guide or teacher.

By educating local inhabitants, tourists and staff on sustainability, the taught mentality can have widespread effects both locally when applied by the inhabitants and staff and internationally by the visitors in their everyday lives around the world.

Apart from educating the guests, increased local education can also give the local inhabitants a sense of pride, increase their self-esteem and safeguard the valuable local knowledge by



Figure 12. A tourist is watching hummingbirds up close as they suck water with honey from the bird feeders. The surrounding plants do not get pollinated to the same extent while the hummingbirds learn to rely on the feeders and get accustomed to being close to humans.

maintaining it within the native community and helping it spread from generation to generation.

Staff and guides should also set a good example by showing respect to the local nature and culture, behave well and inspire to open-mindedness and seeking of knowledge. For example should guests under no circumstances be encouraged or allowed to disturb flora or fauna by, for example, guides unnecessarily breaking twigs or a lodge having unsecure trash cans or bird feeders. These attract animals and birds and teach them that food is supplied in this, to them, unnatural way. This has them hunt or look for food less and make them accustomed to humans, which might have terminal consequences when getting in contact with people with other intentions than just admiration (see figure 12). Bellavista tries to attract tourists with the promise of extensive bird watching opportunities. The lodge has therefore placed several bird feeders around the lodge attracting hummingbirds. Visitors get the opportunity to admire these beautiful little creatures on a close distance, but the hummingbirds learn to feed from the feeders instead of drinking nectar from the surrounding bushes. Their natural habits are thereby skewed and plants in the area are not pollinated to the same extent.

Some case studies also add tourist education indirectly through the familiar setup during meals. The Amazonian lodges group all their guests into teams with one native guide and one multilingual guide. These groups stay together



Figure 13. A sign displaying the trails around the Maquipucuna Lodge encouraging visitors to go on self-guided hikes; an example of passive tourist education.

not only during the rainforest hikes but also at all meals. It showed to be common that not all members of the group knew each other and therefore shared personal stories and experiences during the lodge visit. All guests dine together at one large table at BSI, unless fully occupied, and just like in the Amazon, it gives a sense of boundaries being erased and collective open-mindedness increasing. If the guides would share information on the local surroundings, their environmental and social challenges and success stories at such a social moment, it could increase the visitor's knowledge about local sustainability challenges, expand their awareness of such and similar problems, and help them put their own everyday life into perspective. This could lead to extended networking and in the long run help promote international solutions to globally similar challenges.

Alándaluz's informational signs of how their water treatment system works set a good example of environmental tourist education. It raises people's awareness of what processes that take place after their consumption of the freshwater and might make them think about how the water treatment functions in their home country and what they can do to facilitate it. It was surprising that not more lodges had similar signs, for example Sani Lodge explaining about their solar panels and BSI having informational signs about all their many low-impact systems for producing electricity and warm water, retrieving water and purifying it. BSI's

homepage is, in comparison to the other case studies, very informational, but tourists who do not seek this type of information about a tourist accommodation to base their decision of visit on, or who simply came across the lodge by accident, might not find out about all these clever systems and the deep ecocentric philosophy of the lodge.

When it comes to tourist education about the local culture, caution must be taken to prevent that the local inhabitants and their customs become commodified. It did not seem to be the case at the visited case studies, but other popular tourist spots visited by the author have shown to be displaying the local inhabitants in their traditional garments for the sake of the tourists visiting briefly, without the occasion having any meaning to the local culture. In this sense, the local inhabitants play the same role as animals in a zoo, which is the complete opposite of what rhymes with an ecolodge.

4.3.4 Certification

Introducing an ecolodge certification program is a way of providing official and common ecolodge standards or criteria and controlling that they are properly followed. However, there is so much to be debated and considered regarding certifications that it could be the topic of a thesis on its own. In this section, certifications are discussed briefly based on the question of what use they can be to ecolodges in their development and market competition, and how such a program could be constructed.

As Becken & Patterson (2006) put it, “the quantitative accounting for environmental and social impacts is a critical first step in the process of developing sustainable tourism”. Monitoring is a kind of quantitative accounting and can be a means to receive actual facts and figures and to know where the lodge stands. From here, measures can be taken to change these figures and continued monitoring shows if these measures are giving positive, negative or any results. An ecolodge should therefore have monitors following their water and energy consumption and waste production to make sure the lodge is causing as little negative environmental impact as possible. Keeping these figures down is also good for the economy, since bills and amount of fuel bought can be decreased.

Reasons for the case studies to acquire a certification seemed to be overall about the same; market competition, official confirmation

by accreditation, and pin pointers for good practices. One interviewee mentioned words such as “respect”, “prestige”, and “assurance” that the lodge is not harming the environment. According to the interviews, most of the case studies were positive to certifications and were already certified. However, it did not appear to be a burning interest, mainly since the costs and time needed to acquire and keep such certifications are relatively high.

Further, manager of Black Sheep Inn Andres Hammerman wrote in an online correspondence (see appendix E) that he is critical to certifications since he thinks tourists should choose to visit the lodge for the natural landscape and cultural experience, not for the sustainability features of the lodge. Hammerman asks why BSI should pay for a third party to put a label on what makes the lodge so authentic and special, when they have received awards and media attention simply by their guests telling others about their experiences.

This argument is easily accepted for a lodge like BSI with such devoted and knowledgeable managers, but certifications can also be useful as a tool for tourism operations that lack similar level of knowledge or inspiration. Richard Parsons at Bellavista said that the Smart Voyager certification was handy during the initial stages of improvement. The criteria for requiring the certification can then be helpful in providing inspiration for changes, composing policies and improving practices.

However, to have a certification might not matter that much for the operation in the long run if guests are unaware of what it stands for, or if auditors show little interest or follow up too seldom. Also, many tourists might not realize the differences between deeper and shallower sustainability efforts or certification schemes, which dishonest lodge managers can take advantage of. Competition between lodges to become certified is weakened if there is no demand from guests or no other substantial advantages in getting the certification.

On the other hand, certified lodges might ignite a demand from guests by informing them of the certification they have and what it means for environmental and socioeconomic sustainability. Also, an environmental certification often helps to lower an operation's expenses in the long run through decreased energy use, water use and waste production, as well as through the creation of policies and education of management and staff on sustainable procedures.

As mentioned previously, there is a multitude of certification programs, accreditation schemes, codes of conduct, benchmarking systems, business standards, etc. for both general tourism and ecotourism businesses. One of the most widely known ecotourism certification programs could be the GreenGlobe 21 certification, which encourages environmentally, culturally and socially responsible tourism. Carter et al. (2004) point to weaknesses in this program such as the demand for specified knowledge and time being an impediment for its implementation. It is also process driven instead of based on performance, which means that, hypothetically, credits are given for the planning of changes instead of looking at which changes have actually been made and which effects they really have.

Further, Carter et al. (2004) say that many tourism businesses follow environmental regulations during their initial stages of development, but lack regulations once the business is up and running. At that stage, the tourism business is producing services, which often do not have as many environmental regulations to go by in comparison to the operational stage of industries producing products. This is of course not optimal, and regulations concerning environmental, social and economic impacts are necessary at the operational stage of tourism businesses as well.

A suggestion for the layout of an ecolodge certification could be to have a few mandatory demands with over-all ambitions and philosophy, in combination with a longer list of criteria. Which criteria to fulfil would be voluntary, but each met criteria give points that together would have to add up to a minimum score. For each audit or updated certification, the minimum score could be raised by a few per cent or points to push for continuous sustainability improvements.

It appears that many of the existing schemes are fairly wide in their coverage. For example The Green Key, an international eco label for tourism facilities, provides baseline responsibility criteria for campsites, hotels and attractions. Each participating country can then develop its own national criteria based on these baselines. This means the national climate and infrastructure is taken into account, according to the Green Key homepage (Green Key, 2011), but it could also be argued that criteria that differ between countries would add to the confusion of what the certification actually stands for.

Further, the certification can be divided into different versions eligible for, for example, campsites, hostels, hotels, hotels with conference venues, mountain lodges, etc. An ecolodge certification would on the other hand only focus on ecolodges, which would include more defined boundaries to the size, operation and activities of the business. This would hopefully dissolve the confusion around which operations are ecolodges or not, and facilitate for prospecting tourists.

4.3.4.1 What's the weather like?

But what makes a good certification, especially if it is to be eligible for ecolodges worldwide? In the Mohonk Agreement (2000) it is recognized that tourism certifications need to be suited for the specific geographical conditions of each business.

Since the tourism sector is global, there should be as many different situations to adapt to as there are businesses. However, splitting the scheme into sections based on geographical settings would most likely be fallible since areas with the same geography can have different climate. For example, in the Ecuadorian Sierra region, locally grown food should be easy to get hold of since the region is mainly farmed. But ecolodges on the same altitude though higher latitude would find that difficult. An ecolodge at 3,500 m in the French Alps would not be able to provide its guests with fresh, locally grown food all year round. This emphasizes the need for certification criteria to be based on climate rather than geography. As shown in chapter 3, the surroundings and natural conditions are strikingly important to an ecolodge in its strife to be as adapted as possible to the local climate and environment in order to be the most sustainable it can.

Hence, an international ecolodge certification needs to be eligible for every type of climate or climate zone – or be generalized enough to cover them all in one version. The latter suggestion might be more feasible since it could be possible by for example providing alternatives for each target suited for different climate types. It is also imaginable that several versions of the same certification could be created, e.g. for desert, rainforest/tropical, humid-temperate, dry-temperate and even arctic lodges. The principles would be the same for all, but the examples and alternatives would differ since the terms for sustainability are related to the specific situation of each lodge. With several different versions the certification could also be

more accurate and precise and thereby maintain its credibility and reputation.

4.3.4.2 Having to choose

Patterson et al. (2006) claim that for a tourism business to be sustainable, it is necessary with both mitigation of and adaptation to climate change and its effects. This can be expanded to also include sustainable resource use, biodiversity loss, pollution, etc. As an example, if the biodiversity in a rainforest area is decreasing due to deforestation, an ecolodge in the area having birding as its strongest marketing tool is facing tough challenges. Therefore, it is relevant to the ecolodge to mitigate the deforestation (at local, national or even global political level) and adapt to the already caused, permanent damage (by for example enhancing local cultural activities and handicraft instead).

Patterson et al. (2006) also highlight that if time, money or resources are limited, many tourism businesses choose either mitigation or adaptation measures, although both are necessary for an ecolodge's sustainability. It would not be surprising then if many businesses also most often choose economy over environment if both are difficult to manage simultaneously. This issue should be considered and included in a certification program for ecolodges, and any problems of having to choose between these important measures should be relieved as much as possible.

An idea is to construct the certification so that there are a few criteria that are mandatory and a longer list of scored criteria. All mandatory criteria would need to be fulfilled and could include mitigation as well as adaptation measures, environmental as well as socioeconomic criteria. The ecolodge can then have more freedom in choosing which scored criteria to meet in order to reach a minimum requirement of credits. If all mandatory criteria are fulfilled and enough credits are collected, the tourism business acquires the right to call itself an ecolodge.

4.4 Does practice fit theory?

The case studies definitely showed to have at least environmental sustainability in mind more than the average conventional tourist accommodation, and proved for several reasons to be part of a different type of tourism than the mainstream.

After having seen the case studies in operation and touched upon their challenges, the definitions mentioned in chapter 2 seem like abstract and over-shooting idealistic dreams. But a high jumper will only aim as high as the bar is set, which means that an ambitious ecolodge definition is necessary for ecolodges to rise above the average intrusion tourism can bring.

A difficulty with definitions in this sense however, is how literally to interpret them. Can an ecolodge in a cold temperate or arctic climate zone be "nature-dependent" only half the year or not grow any of its food at all and still be called an ecolodge? And can a lodge that is built entirely from reused materials and designed so that it is "integrated with the natural environment" be an ecolodge even if it is situated in an urban area? The found definitions could both include and exclude operations like the examples above, and thereby appear too shallow or unspecified to support the idea of a more neatly described ecolodge concept.

Abstract as the definitions are, the case studies could fit in practice with the theoretical descriptions, but to make the comparison less arbitrary, official principles or criteria should come with the official ecolodge definition.

As written in the book *International Ecolodge Guidelines* (Mehta et al., 2002), "ecolodge guidelines are particularly needed [...], in order to ensure that ecolodges meet the highest possible international standards, not the cost-saving eco-efficiency approaches being promoted by the mass tourism industry".

This connects to the question of shallow and deep ecotourism, described by Acott et al. (1998). A shallow ecolodge would in this sense mainly use the prefix for green-washing of a business that is not based on ecocentric values, but is basically run for the profit of a few people. The lodge could use energy-saving light bulbs since it is a means to cut costs, but would acquire its electricity from fossil fuels. The operation could be located in a pristine natural area, which would be highly recommended to visit, but the level of comfort and luxurious accessories at the lodge would be prioritized before making the environmental intrusion and use of natural resources as limited as possible. These types of practices could result in medium-aware visitors feeling very content with their holiday believing they had chosen a greener alternative, but that is not actually that beneficial to neither the local environment, society nor economy.

Some of the case studies showed tendencies to end up further toward this end of the scale,

where lighter interpretations of parts of the ecolodge definitions in chapter 2 can also belong. However, none of the case studies seemed to be deliberately aiming that way, but imagining cases of so called ecolodges that are much worse was not difficult when contemplating along this line.

A deep ecolodge, on the other hand, and as Acott et al. (1998) explain the term, is based on the belief that the business is a part of the surrounding environment, that community participation is important, and that materialism and dependence on large-scale technology and fossil fuels is wrong. A deep ecolodge would not force someone or something else away for the sake of its own development, but try to integrate, if possible, and as harmlessly as possible.

Idealistically, one could claim that all ecolodges should be deep ecolodges, especially if the ecolodge concept was to be specified and made official. However, there would still be a scale for ecolodges to be placed along, and the risk would be that that scale would turn too short for any business to fit on.

Perhaps then it is better to keep the ecolodge concept slightly wider than that, but to introduce different grades of sustainability or an easily accessible table of all registered ecolodges and their confirmed goals, levels and efforts for facilitated comparison and overview. This could raise friendly competition and inspiration among lodges, and help inquiring tourists in realizing what is actually being done by which lodge. This brings about an idea of having minimum criteria for a tourism operation to call itself ecolodge, but with no upper limit to the sustainability development. Operations fulfilling the minimum criteria would be posted on this list and hopefully competition and demand, could help inspire to further sustainability improvements.

Something the literature definitions do not bring up, but Carter et al. (2004) describe, is the importance of motivated and engaged owners or managers for successful environmental performance, as mentioned in the beginning of this chapter. Strong ethics with a single, but influential, person can make the entire base for an ecolodge to be deep and ecocentric. But Carter et al. (2004) also point out that it is essential that this person communicates these ethics to the staff members for the beliefs to permeate the entire business. Of course, it might be impossible to write a definition or criteria that requires an ecolodge owner to have strong sustainability ethics, and it would be incredibly difficult to measure for a potential list of

registered ecolodges. Yet, it appears evident for a true ecolodge to have one.

4.4.1 Nature conservation

Several of the ecotourism definitions discussed in chapter 2 mention the importance of nature conservation. Since the ecolodge is found to fall under the broader ecotourism concept in that same chapter, an ecolodge should also do what it can to protect its surrounding natural assets – but not only through improving its own lodge practices but also through actively protecting and conserving natural areas.

Examples of this among the case studies are good and plenty: Maquipucuna's founded private reserve with reforestation projects; Cantalapiedra of Alándaluz, protecting rare forest and being used for organic food production for the lodge; the Sani community starting their lodge to protect their vast, private land from being exploited by oil companies; and so on.

Nature conservation was not included as an aspect of environmental sustainability since its importance was not realized until after the visit to Ecuador. However, it has been found crucial for the ecolodge concept and is therefore described here in chapter 4.

The case studies' efforts for nature conservation were impressive, not only by the number of hectares protected but also for the reasons, which often did not rest on short-term financial benefits but on ecocentric conservation values.

Stern et al. (2003) show that according to their study on Costa Rican ecotourism businesses, almost half (47.7 %) of their 117 asked participants claimed that legislative reasons are the most important for a decrease in deforestation. Only 12.5 % pointed out environmental awareness and another 12.5 % mentioned tourism. However, the latter two reasons seemed to be the two main reasons for nature conservation for the Ecuadorian case studies. For example, Maquipucuna started as a nature conservation organization, which began its operation by buying deforested land in order to protect it from further destruction. The Maquipucuna Lodge was erected several years later and as a means to support the nature conservation projects economically, not the other way around.

Black Sheep Inn was the only case study not owning land for the direct or indirect sake of protecting it. However, the lodge managers have made continuous efforts for over a decade to

strengthen the protection and sustainable management of the nearest reserve, Iliniza Ecological Reserve, covering 149,000 ha.

Protected nature also seems like a wise feature for an ecolodge to have since it is a manifested, literal effort for environmental sustainability. If the ecolodge owns the protected land as well, they can feel assured of a long-term, physical attraction for many tourist seasons to come.

Nature conservation in the shape of protected land, reforestation projects, support of local farmers to convert to organic farming, etc. are all examples that could be eligible as mandatory criteria in the ecolodge concept - especially so if constant improvements mean growing areas that are protected and managed sustainably.

4.4.2 The Smart Voyager

The 13 Smart Voyager principles (attached as appendix D) are adapted to land based ecotourism operations, but could very well be

eligible as ecolodge principles with some adjustments.

The principles are relatively detailed regarding the socioeconomic sustainability indicators used in this thesis, and which the certified case studies generally scored higher at, but are more vague on the environmental sustainability indicators. Conservation is highlighted in two principles, and waste management also has its own principle but construction, water, energy and food are not mentioned at all. However, they could fit under the principle “Reduction of negative impacts on the environment”, but defining the importance of sustainable management of these four strong environmental factors could not hurt.

Neither do the principles hint that any specific philosophy or ideal should underline the whole operation or that it should try to adapt physically and aesthetically to its local surroundings. However, the eligibility of the Smart Voyager principles as ecolodge principles is an example of how the ecolodge is related to ecotourism but going that extra mile for sustainability.

5. Summary and Conclusions

Today, tourism is the largest business sector in the global economy and it keeps expanding (TIES, 2006; UNWTO, 2011). It can bring environmental and social devastation if invading a new location unmitigated (Becken & Patterson, 2006; Patterson et al., 2006; UNEP, 2010), but can also mean an economic upswing and poverty alleviation due to increased job opportunities and influx of foreign currencies (TIES, 2006).

The average tourist comes from an economically developed country, which are the main contributors to climate change, and visits an economically developing country, which are the ones most struck by its consequences (Patterson et al., 2006). Since the global human population shows no sign of travelling less, this means that increased sustainability measures within the tourism sector is highly called for.

5.1 What is an ecolodge?

5.1.1 According to the literature

The literature review revealed that there are relatively few articles on ecolodges. Some attempts at describing the ecolodge concept were found, but no official or commonly used definition surfaced. However, a general emphasis on the importance of environmental sustainability and adaptation was noted. Aspects of socioeconomic sustainability appeared as well, but were not as extensively described.

According to the ecotourism and ecolodge descriptions mentioned in chapter 2, an ecolodge can, according to the literature, be described as an ecotourism business in the shape of a delimited accommodation facility. All definitions included that the ecolodge is connected to ecotourism through its location that is close to, or in, a natural area. Added together, but not unanimous, the definitions say in different ways that an ecolodge operation is environmentally, socially and economically sustainable, especially through nature conservation, local community cooperation and tourist education.

5.1.2 According to the case studies

After having visited the seven case studies in Ecuador, an image of an ecolodge has grown

increasingly clear. The case studies all appeared to strive for sustainability but to various extents. They proved to be aware of issues of lacking sustainability in today's tourism society and showed an aversion to going down that same path, though the actual efforts to be more sustainable were very varied. Though none of the case studies actually bore the name "eco"-lodge, they seemed proud of being connected with it, however abstract and undefined the concept is.

As visualized by table 2 in chapter 3, the two Amazonian case studies have done exceptional socioeconomic efforts to support the local community and provide good tourist education about the local environment, culture and community. Sani Lodge has also made exceptional efforts for nature conservation with their own 39,000 ha now protected from exploitation due to the interdependency between the natural environment, the local community and the lodge.

However, the two rainforest lodges proved to have made fewer efforts regarding the environmental indicators. Black Sheep Inn was the only case study that acquired higher score for environmental indicators than for socioeconomic, and also got the highest total score by far.

In conclusion, the case studies put more emphasis on socioeconomic sustainability in practice, than on environmental sustainability, which was what the theoretical literature focused more on.

5.1.3 The ecolodge concept

A true ecolodge should then be an emulsion of theory and practice in this case; strong environmental sustainability and conservation efforts, as according to the literature, and extensive socioeconomic sustainability efforts, based on the case studies.

The nine chosen indicators of environmental and socioeconomic sustainability proved legitimate, with the addition of nature conservation. However, many different aspects appeared within each indicator. Water, for example, was investigated regarding source, potable water, conservation, monitoring, harvesting, reuse and wastewater treatment. This implies that a few principles accompanying an ecolodge definition will not provide sufficient criteria for the determination of which operation

is a sustainable ecolodge or not. Stating relevant criteria for each principle could be a welcomed consequence of this thesis.

However, what is accurately “sustainable” is difficult to decide since no one knows what the future holds or which needs or consumption patterns will occur of future generations. But terms of sustainability must be set for it to be possible to assess the sustainability of anything.

The definition of ecotourism provided in the Mohonk agreement (2000) appears all-embracing and eligible as base for an ecolodge definition. With some adjustments and influence from the other literature definitions as well as the case studies, a suggestion for an official ecolodge definition is as follows:

An ecolodge strives for environmental, social and economic sustainability through tourism in or near a natural area, which conserves the local environment and supports the local communities long-term, socially and economically, and actively fosters environmental and cultural understanding, appreciation and awareness, both among its visitors as well as among the staff and local inhabitants.

According to this definition, the two Amazonian case studies, Maquipucuna in the cloud forest and Andean Black Sheep Inn are eligible for the ecolodge title, while coastal Alándaluz, Andean Polylepis and Bellavista in the cloud forest fall outside the concept.

Black Sheep Inn stood out among the case studies, acquiring 50 % more points than the case studies that scored second highest (see table 2 in chapter 3). The lodge is a member of TIES, the Ecuadorian Ecotourism Association (ASEC), a carbon-offsetting program, and more. On their homepage they promise discount to people who arrive by bike and thanks them for not polluting. They serve exclusively vegetarian food and let all their guests share the same table which creates a feeling of every person belonging to the same family, no matter the nationality, religion or education level. The lodge has also supported the construction of a recycling center, which the community gains more from than the lodge itself, and they support the local school with for example regular English classes, donated computers, the opening of a village library, and more. These extensive and continuous aims for all-round support of the local environment and community is what a true ecolodge means to the author after having worked on this thesis.

Of course, improvements can always be made and BSI could for example expand its efforts for nature conservation and active tourist education. However, Rome was not built in a day, and Black Sheep Inn keeps building on its sustainability practices.

If an ecolodge concept can be made official with this level of standards, and if they are properly monitored and controlled, it is evident that ecolodges would add sustainability to the vast tourism sector. What is actually sustainable varies over time depending on the average extent of man’s exploitation of our planet, which is why it is difficult to say if ecolodges are sustainable. However, they are far more sustainable than the average tourism operation, and can hopefully push the average sustainability efforts in tourism up a notch if the ecolodge concept is spread globally and affects the choices of the average tourist.

To ensure the ecolodge concept is sustained internationally for the credibility of the eligible operations, and so that the name is not misused, an ecolodge definition with principles and criteria is recommended to be made official. A suggestion for an official ecolodge definition is stated above, and principles based on the research for this thesis follow below. However, criteria for each principle should be added for a more detailed and thereby clear image of what a true ecolodge is.

With official principles and definitions, a certification program is already in the cradle. An ecolodge certification program should be international for the sake of spread awareness and increased understanding, and adaptable to the local natural and climatological circumstances for each lodge. The principles and criteria of the certification should be accessed for anyone, and the results of each certified operation should be searchable for any inquiring tourist.

With one, or a few, specific certification programs for ecolodges, the greater concept of ecotourism and the more specified and elaborated concept of ecolodges, could be more complete.

5.1.4 Ecolodge principles

In the beginning of the work on this thesis there was an idea of finding the perfect ecolodge. However, this title can most likely only be acquired by one, or a few, lodges worldwide, which makes it more useful to set minimum criteria for acquiring an ecolodge certification

instead of looking for perfection. This way, more ecolodges can reach and affect more people and if the criteria also include constant improvement, there is a guarantee these selected businesses will only get better and better.

Below are suggestions for principles a tourism operation should have to fulfil in order to righteously call itself ecolodge, apart from fitting the suggested ecolodge definition mentioned above in section 5.1.3. A hope is that relevant criteria for each principle will be also be added, and eventually an ecolodge certification might see the light of day.

An ecolodge...

Generic principles:

1. ...constantly strives to be as environmentally, socially and economically sustainable as possible throughout its operation, and encourages competitors and everyone involved in the ecolodge to do the same.
2. ...cooperates with other ecolodges to exchange knowledge and experiences, and works to be a part of an international ecolodge network that pushes for joint sustainability and tourism causes on international and global levels.
3. ...applies an ecocentric perspective on its operation and responds to the philosophy of ecotourism by prioritizing improved life quality over high material standard.
4. ...is not run solely for the purpose of economic profit nor to expand indefinitely.
5. ...is close to a natural area and relatively untouched nature, but not necessarily located in a remote or secluded area.
6. ...stays updated on news and research findings, as well as changes in national policies, so that development of the lodge, adaptation to the surroundings, and conservation efforts are based on proven knowledge and facts.

Environmental principles:

7. ...actively supports and promotes the conservation of natural environment and endemic species, the protection and sustainable use of natural resources, and implements a sustainable management system.
8. ...uses water, energy and food from several sustainable sources to increase its resilience and lower its negative environmental impact.
9. ...conserves water by extensive reuse and water-saving practices, and conserves energy by

energy-saving practices and by choosing energy-saving or non-electrical products.

10. ...monitors use of water and energy as well as production of waste, in order to stay informed about current use, to see if conservation efforts have effect, and to keep environmental impacts down.
11. ...applies a life-cycle perspective on every bought commodity or chosen material.
12. ...applies a building design that is adapted to local natural conditions, physically and aesthetically; that facilitates dismantling and recycling at the end-of-life stage; and that is based on locally sourced and/or reused material.
13. ...takes responsibility for its produced waste and wastewater by minimizing the production and by recycling, reusing and properly treating the waste and wastewater that is still produced.

Socioeconomic principles:

14. ...does not house discriminatory values regarding the gender, religion, nationality or sexuality of neither visitors, employees nor local inhabitants.
15. ...improves the quality of life of its employees and their families by providing proper salary and safe and fair working conditions for all, staff accommodation (if requested by the employees) and the liberty to join a workers' union.
16. ...hires local inhabitants as much as possible to support the local economy and to involve the local community in the operation. If knowledge is lacking to do a job local inhabitants are physically able to do, people from farther away can be hired while the locals acquire education and training, arranged by the ecolodge, to do the job.
17. ...actively contributes to the sustainable development of the local communities, by supporting and promoting local education, healthcare, poverty alleviation and safety, and by promoting local companies, such as handicraft cooperatives, agricultural producers, and service businesses, to its visitors.
18. ...provides continuous education and training for staff, local inhabitants, and tourists about environmental and socioeconomic sustainability; how tourism, the ecolodge and themselves are connected to sustainability; and encourages everyone to play an active part in reaching it.

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Tables and Figures

Table 1 and 2 are made by the author and filled in with data collected during the visit to Ecuador in 2008-2009.

Figure 1, 3-9, and 12-13 are private photos taken by the author during the visit to Ecuador in 2008-2009.

Figure 2. Map of Ecuador, adjusted from University of Texas Libraries, Perry-Castañeda Library Map Collection; *Ecuador (Shaded Relief) 1991 (259K)*. Retrieved March 28, 2009. Original image in color and without numbers 1-7 and the border between the provinces of Napo and Orellana. http://www.lib.utexas.edu/maps/americas/ecuador_rel91.jpg

Figure 10 and 11 are made by the author and based on data collected during the visit to Ecuador in 2008-2009.

Relevant literature read but not referred to

"Guía de buenas practicas para turismo sostenible en bosques tropicales – Empresas de alojamiento". Guide provided to tourist accommodation businesses that have obtained the certification managed by Rainforest Alliance, UNEP, et al. (no printed year of publication)