

Coastal Development Decision-Making in Costa Rica: The Need for a New Framework to Balance Socio-Economic and Environmental Impacts

by

Maricarmen Esquivel

BA in Economics
Georgetown University, 2002

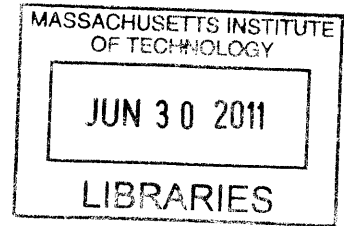
MSc in Environment and Development
London School of Economics and Political Science, 2004

Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of

Master in City Planning
at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
June 2011

© 2011 Maricarmen Esquivel. All Rights Reserved



ARCHIVES

The author here by grants to MIT the permission to reproduce and to distribute publicly paper and electronic copies of the thesis document in whole or in part.

Author _____
Department of Urban Studies and Planning
May 19, 2011

Certified by _____
Professor Lawrence E. Susskind
Department of Urban Studies and Planning
Thesis Supervisor

Accepted by _____
Professor Joseph Ferreira
Chair, MCP Committee
Department of Urban Studies and Planning

Coastal Development Decision-Making in Costa Rica: The Need for a New Framework to Balance Socio-Economic and Environmental Impacts

by

Maricarmen Esquivel

Submitted to the Department of Urban Studies and Planning
on May 19, 2011 in Partial Fulfillment of the Requirements
for the Degree of Master in City Planning

Abstract

Costa Rica needs to pay attention to the rapid change that coastal regions have been undergoing as a result of tourism and real estate projects. Despite the economic benefits in terms of jobs and foreign investment, many have raised concerns over construction in high slopes, approval of projects without the necessary water and wastewater infrastructure, deforestation, and the displacement of the local population. Is there a way to promote development in coastal areas of Costa Rica while still preserving the natural environment and benefiting coastal communities in the long term? What is the process currently in place to determine a project's potential impacts, and what changes need to be done to this process in order to make sustainability more likely? To answer these questions, this thesis studies the Environmental Assessments conducted for three tourism and real estate projects in the Pacific Coast of Costa Rica to determine how environmental, economic, and social tradeoffs have been made in practice. The analysis shows weak assessments, lack of push-back from government agencies and inadequate monitoring, and a high number of legal complaints that have not been sufficient to incentivize good practices. As coastal areas are being urbanized, Costa Rica has embarked on an ambitious effort to improve the cadastre and land use plans of these areas, in part to give more security to foreign investors. A window of opportunity currently exists to improve the sustainability framework in the country, including strengthening the National Environmental Technical Secretariat and the Environmental Administrative Tribunal, updating environmental assessment regulations, and enhancing land use planning capacity. These recommendations should be implemented through a collective effort led by the Ministry of Environment, and including other relevant government agencies, local and international environmental NGOs, universities, the private sector, and local communities. Having clearer rules for development in coastal areas will ultimately benefit all stakeholders.

Thesis Supervisor: Lawrence E. Susskind

Title: Ford Professor of Urban and Environmental Planning

Acknowledgements

I am immensely grateful to Professor Larry Susskind for all his guidance, time, and support in this thesis process and throughout my two years at DUSP, for helping me frame this research, and for reviewing many drafts. Thank you, Prof. Susskind, for your commitment and dedication to student learning and development. I would also like to thank my reader at DUSP, Professor Annette Kim, and all the other Professors that make being a student in this program such an incredible opportunity.

To my reader in Costa Rica, Dr. Rosendo Pujol at ProDUS - UCR, for all his insight and time to help me better understand how environmental and land use planning happens in the country. To all the interviewees in Costa Rica, and to two anonymous reviewers who know the country very well, thank you for your time and for sharing your ideas with me, without you this work would not have been possible. The author of this thesis is solely responsible for any errors or omissions in the study and for its conclusions.

To the Department of Urban Studies and Planning at MIT, for the grant that made it possible for me to conduct a second round of field research. To Sandy, Kirsten, Nina, and CRON at DUSP, and Sossi at CBI, for all their continued patience and support these past couple of months.

A heartfelt thanks to my mom Gabriela, who has been a true champion, and the best field work travel partner ever. To all my family and friends, for all their love and support, and to my classmates at DUSP, who never cease to amaze and inspire me.

I dedicate this thesis in its small way to the beautiful country of Costa Rica, with faith in its capacity to keep breaking ground on issues of peace and sustainable development.

Table of Contents

	Page
Chapter 1: Introduction	5
Chapter 2: A Framework for Sustainable Development Decision-Making	13
The Environmental Impact Assessment as a Tool.....	14
Sustainable Development Decision-Making in Costa Rica.....	17
The Permit and EA/EIA Process in Costa Rica.....	18
Relevant Laws and Regulations.....	19
Breaking the Silos and Learning to Make Better Decisions.....	28
Looking at the Sustainability Framework in Costa Rica in Practice.....	29
Chapter 3: Case Studies	31
The Context: Economic and Social Indicators in the Chorotega and Central Pacific Regions.....	31
Tourism and Real Estate Investment in Costa Rica.....	34
Recapitulate the Framework for Analysis.....	36
The Three Case Studies.....	37
Case Study 1 – Hotel RIU.....	37
Case Study 2 – Marina Pez Vela.....	56
Case Study 3 – Vista Perfecta Phase II Apartments.....	71
Chapter 4: Cross-Case Analysis	90
SETENA Checks Mostly for Compliance with the Law.....	90
SETENA Has Weak Monitoring Capacity.....	93
Complaints Don’t Produce Much Change.....	94
Conclusion.....	95
Chapter 5: Recommendations	97
Coastal Development Opportunities and Challenges.....	97
Recommendations.....	99
A ‘New’ National Sustainable Development Framework.....	99
Update EA/EIA Regulations.....	104
More and Better Planning.....	109
Conclusion.....	120
References	122
Appendix 1– Excerpt from SETENA’s D1 Form Template (Scoring Matrix)	130
Appendix 2 – Employment and Poverty Changes in the Chorotega and Central Pacific Regions (2001-2008).....	131
Appendix 3 – Main Points from Hotel RIU’s Environmental Management Plan.....	132
Appendix 4 – Main Points from Marina Pez Vela’s Environmental Impact Assessment.....	135
Appendix 5 – Main Points from Vista Perfecta Phase II Apartments D1 Form.....	138

Chapter 1: Introduction

Coastal communities in Costa Rica are at a crossroads. Intense development pressures over the last ten years, generated mainly by tourism and real estate investment, have brought economic benefits like foreign capital and increased employment¹. This new development focus is now dominant in the Chorotega (Guanacaste) and Central Pacific (Puntarenas) regions of the Pacific coast of Costa Rica. Guanacaste experienced a 589% growth in construction as measured in square meters from 2003 to 2006, and Puntarenas a growth of 314%. In comparison, the capital city San José, the most densely populated province in the country, experienced a growth of 46% (Estado de la Nación, 2007, pp. 10). For the most part, these investments have been welcome.

However, as communities continue to experience a rapid shift from predominantly agricultural/rural to more service oriented/urban and suburban systems, the economic, social, and environmental costs associated with intense coastal development are becoming more evident. According to the Environmental Administrative Tribunal (TAA), some of the most frequent problems in coastal projects include deforestation and construction in areas with high slopes, in the public coastal zone, and close to river channels (TAA, 2008). The coastal landscape has also attracted an increasing number of mega-resorts and gated communities. Many are now asking whether the social and environmental costs of all these projects are worth the economic gains. Although Costa Rica has been recognized for its national parks and its

¹ Chapter 3 provides an analysis of employment changes per productive sector for the Chorotega and Central Pacific Regions for the period from 2001-2009. For the Chorotega region, total employment increased by 19% over this period; agriculture employment decreased by 29% and construction employment increased by 73%. In the Central Pacific region, total employment increased by 19%; employment in agriculture decreased by 32% and employment in construction increased by 43%.

commitment to eco-tourism, the model of development pursued in the north and central Pacific Coast has had less of a sustainability focus.

The Environmental Assessments (EA), or Environmental Impact Assessments (EIA),² that investment projects must submit and have approved before construction can begin, are a useful lens through which these tradeoffs can be explored. In this thesis, I will examine the EAs and EIAs for three fairly large coastal development projects in Costa Rica. I will also explain the links between these environmental assessments to the Maritime Terrestrial Zone Law (LZMT – *Ley de la Zona Marítimo Terrestre*), and to planning tools such as the Coastal Regulatory Land Use Plans (*Planes Reguladores Costeros*). Despite Costa Rica's efforts in sustainable development, the three cases show that the EA/EIA³ process is being used more as a bureaucratic procedure rather than as an opportunity to pursue projects that are in the public interest.

Decisions are being made about tourism and real estate projects along the coasts of Costa Rica. How can we distinguish good projects from bad ones? I will argue in this thesis that the process by which projects are (or should be) scrutinized matters, and that better tools for prospective review of what is being proposed could yield better results. Not everyone agrees, of course, on what is a good project, or how to determine this.

² According to the National Environmental Technical Secretariat (SETENA – *Secretaría Técnica Nacional Ambiental*), the Environmental Assessment (EA) is an “administrative scientific-technical process to identify and forecast a project/activity’s potential impacts on the environment, and to quantify and assess them in order to guide decision making.” The objective is to prevent, control, mitigate, and if necessary compensate for the impacts that a project may have on the environment. Depending on the scope of the project, an Environmental Impact Assessment (EIA) is required (author’s translation). From SETENA, *What is an Environmental Impact Assessment?*

³ In many parts of this thesis, I am using EIA to refer to the broader EA/EIA process.

The following example is a composite case of coastal development in Costa Rica that serves to highlight the tensions and multitude of actors involved in approving, developing, and monitoring a coastal project. Although it does not refer to one specific project, it is inspired by a variety of real life examples.⁴

A foreign development company has purchased 800 hectares of land in Palmeras, a small coastal town of 10,000 people along the Pacific Coast of Costa Rica. This area has a dry climate, and the flora and fauna are typical of the tropical dry forest. The developer bought the land at \$450,000 per hectare (for a total of \$360,000,000) from a local businessman who used to have a large cattle ranching farm. The developer includes a team of architects renowned in the Caribbean for their design work. They have partnered with Costa Rican investors under the umbrella of a corporation that serves as the legal entity spearheading the project. The corporation has been working for the past year on an overall Master Plan for the area which will be implemented incrementally, in five phases. The Master Plan calls for three hotels, of 400 rooms each, three residential projects with a total of approximately 1,000 units, two eco-golf courses, and a marina.

The company has submitted its Plans for phase one, which includes the first hotel, an 18-hole golf course, and one residential project of 200 units, with condos ranging from 150m² to 500m². The total square footage of Phase I is 136,000m² (100,000 m² for the hotel, and 36,000 m² for the apartments). The developer has submitted an EIA and other documents to the respective agencies at the national and local governments, as required, and has waited four months so far for approval.

⁴ I am taking the idea of a presenting case from Susskind and Cruikshank (1987).

The Mayor of Palmeras would like to see this project approved as soon as possible. Despite the importance of agriculture and cattle ranching as major employment in the area, he believes that tourism will be the economic propeller for the region as it goes forward. Moreover, he sees an opportunity for Palmera to consolidate its position in the tourism sector through this anchor project.⁵ The municipality has approved numerous real estate development projects, but this is the first one to include a large hotel and marina. Although, at present, the municipality does not have a zoning map or an urban plan, the project complies with the standards published by the Ministry of Housing and Urbanism (INVU) with regard to new construction.

The developer has applied to the Costa Rican Tourism Institute (ICT – *Instituto Costarricense de Turismo*) for a concession to build in the Maritime-terrestrial Zone (ZMT – *Zona Marítimo Terrestre*). The ZMT refers to the first 200 meters of coastal area, which is property of State, the first 50 meters of which are public. The other 150 meters can be leased by concession to private developers under certain conditions. The ZMT is jointly administered by the municipality and the ICT. The ICT is on board with the project, which fits well with the General Regional Land Use and Tourism Development Plan that it has developed for the region (which is at the 1:25,000 scale and allows development all along the coast, making a differentiation only between areas for denser vs. more controlled development).⁶ The project

⁵ The Mayor is also interested in the financial resources that these developments bring to the municipality, by way of permit and tax payments, although he realizes that at the moment in Costa Rica the lack of a good cadastre makes property taxes very low when compared to other countries, and even so, many avoid these payments. With the development boom, the Municipality of Palmeras jumped to 9th place, out of 81 municipalities in the country, in terms of permit and tax collection.

⁶ In areas where there is no official Coastal Land Use Plan, which is technically required before a concession can be granted in the ZMT, the developer's plans for the project were often used instead. This practice was stopped by

also conforms to the more detailed Coastal Land Use Plan that the ICT is currently developing for the area, although this plan still needs to meet some requirements before it can become official. The developer has agreed to contribute financially to the construction of a pipeline to bring water from a nearby aquifer to this and other developments in the area.

The EIA, conducted by an environmental consulting firm based in San José, is being reviewed by the National Environmental Technical Secretariat (SETENA). There has been a delay because an appeal was brought to the Environmental Administrative Court (*TAA –Tribunal Ambiental Administrativo*), housed in the Ministry of Environment, Energy, and Telecommunications (MINAET). Environmental organizations in San José partnered with local organizations to appeal on the grounds that coastal wetlands were being destroyed and groundwater will be insufficient. The developer claims that the land was bought from a cattle ranching farm, which already had destroyed the mangroves in the area, and that the water agency gave the necessary permits for groundwater extraction at reasonable levels.

Meanwhile, the local community is divided. Local fishermen living in portions of the ZMT were evicted a couple of months earlier. They did not have the necessary permits to settle in the ZMT area. The national government has been working with the ICT and the municipalities to develop a clear cadastre for the area. There is a need in the country to regularize land ownership to give security to investors. Most people agree that having clear land titles is

the General Comptroller of the Republic (*CGR – Contraloría General de la República*). Most coastal municipalities do not have land use plans. The ICT, the Cadastre Project, and the Program on Urban Sustainable Development at the University of Costa Rica have been working to develop coastal land use plans for all the Pacific Coast, and the Cadastre Project has also been working on land use plans for the inner areas for Guanacaste. This is a response to the rapid urbanization taking place as a result of the tourism and real estate development boom. One of the missions of the Cadastre Project is to help protect the security of these property investments.

important. However, some community groups are concerned that the push for regularization in the ZMT is just a way to transfer a concession for public land from locals to big foreign investors. There is a sentiment in the area that big developments like this one are a way of privatizing entire beaches and making public access to such areas difficult. There is a realization in the tourism industry that these concerns need to be addressed.

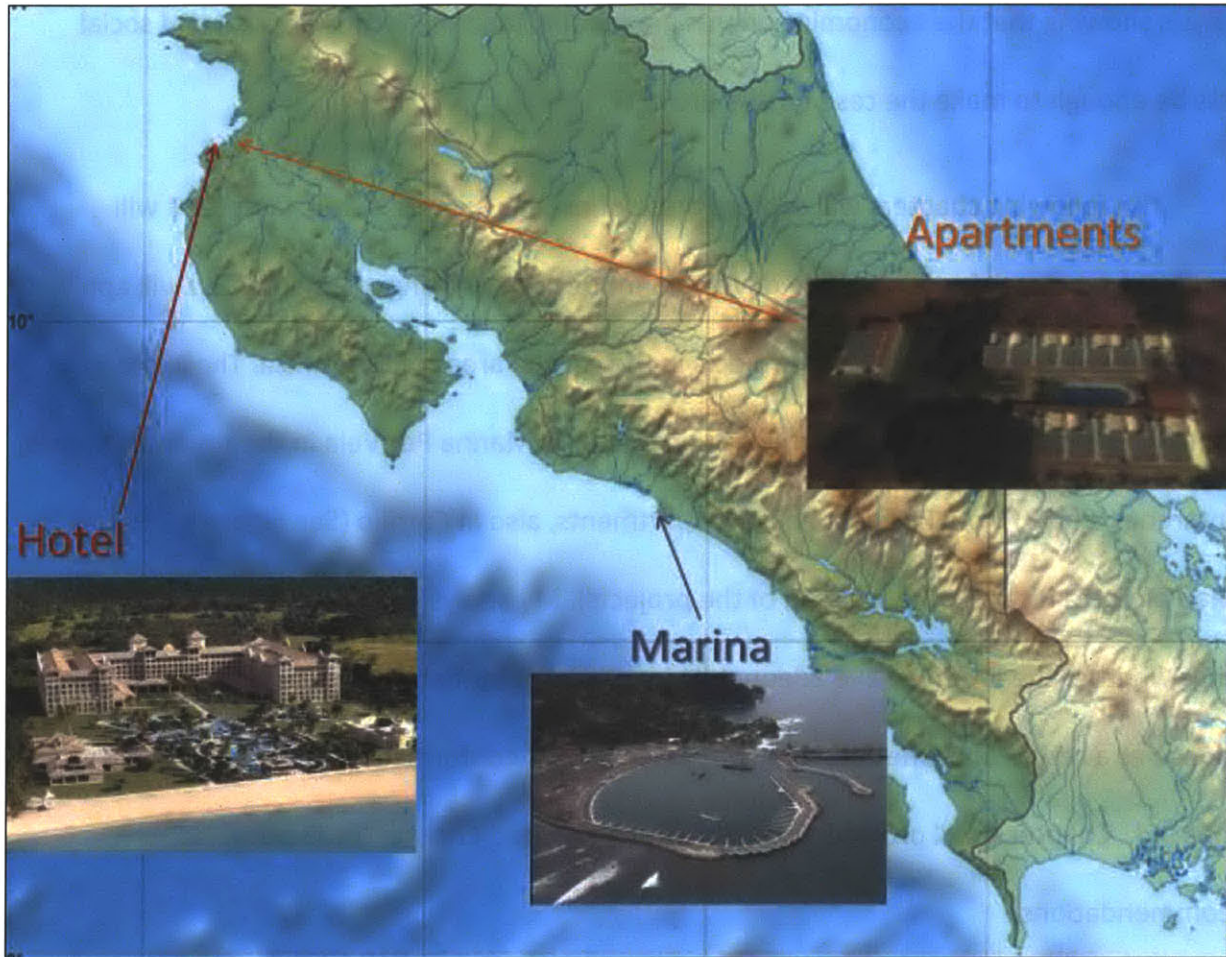
Most locals acknowledge their dependence on tourism. It is usually more convenient to work in the tourism industry than to work in the fields; it also pays better. This project will create 500 jobs during construction and at least 200 permanent jobs during operations. On the other hand, locals are concerned about the long term viability of many of these projects. What will happen to construction jobs once the boom passes? Already, the international financial crisis has slowed down development, and many projects have been abandoned. What about workers who do not speak a foreign language? Will their families be affected by water cuts as the competition for scarce resources increases while infrastructure is slow to catch up? The fact is that many permits in the area have been granted without studies supporting water availability. The price of food and other products is increasing. Bus services are not sufficient for locals to conveniently travel to their jobs. Social problems such as drug related problems are also on the rise.

A decision needs to be made. Should the project be allowed to move forward or not? Are there ways of mitigating adverse impacts that might improve the project? Who should make these decisions, and based on what information? What indicators should the local community, the municipality, the Tourism Institute (ICT), the National Environmental Technical

Secretariat (SETENA), and other relevant stakeholders and decision-makers use? Would an analysis showing that the economic benefits are greater than the environmental and social costs be enough to make the case for the project?

The following chapters will explore these questions in more detail. Chapter 2 will provide a framework for sustainable development decision-making. In Chapter 3, I will apply this framework to three fairly large projects in the coastal areas of Costa Rica. These are 1) Hotel RIU in the Municipality of Carrillo, Guanacaste, 2) Marina Pez Vela in the town of Quepos, Puntarenas, and 3) Vista Perfecta Phase II Apartments, also in Carrillo (See Figure 1.1 below for a Map of Costa Rica and the location of the projects). My analysis will discuss among other things whether the EA/EIAs have adequately identified potential impacts, whether risks were reduced as a result, and whether what was actually built conformed to what was originally proposed. Chapter 4 will provide a cross-case analysis, and Chapter 5 will offer recommendations.

Figure 1.1: Map of Costa Rica and Location of the Three Case Studies



Sources: Map from Wikimedia Commons, http://commons.wikimedia.org/wiki/Atlas_of_Costa_Rica

Image for Hotel RIU from the hotel's webpage, <http://riuguanacaste.com>

Image for Marina Pez Vela from the marina's webpage, <http://www.marinapezvela.com>

Aerial photo for Vista Perfecta Phase II Apartments from Google Earth (author's approximation based on the plans and specifications given in the project file)

Chapter 2: A Framework for Sustainable Development Decision-Making

Sustainable development is generally defined as development that meets the needs of the present without compromising the needs of the future. This definition includes components of intra and inter-generational equity, together with efficient resource use and maintenance of environmental quality.⁷ But sustainability can be a contested concept, and the plurality of values, disciplines and stakeholders involved make it challenging to achieve in practice.⁸ However, progress is being achieved on several fronts.

At the implementation level, sustainable development must draw information and analysis from many different disciplines, including economics, environmental science and biology, engineering, risk management, and social studies. It is well known that no one of these disciplines can answer the sustainability puzzle alone. For example, although Cost and Benefit Analysis (CBA) is an important tool that could be introduced into a sustainable development argument, by itself it is not enough. As noted in an article from Resources for the Future (RFF), as a monetary measure, CBA cannot address important impacts that are not easily monetized, a limitation that is further exacerbated by the “high level of non-quantifiable uncertainty (in other words, there is limited information about underlying processes rather than just statistical uncertainty about key parameter values) and the possibility of very adverse effects” (Toman, 1998, pp. 6). CBA also fails to take into account distributional concerns, both within and across

⁷ Emberton and Therivel (2009) note that the UK government’s sustainable development strategy promotes: 1) living within environmental limits, 2) achieving a strong healthy and just society, 3) using sound science responsibly, 4) promoting good governance, and 5) achieving a sustainable economy.

⁸ For more definitions of sustainable development, see Pezzey 1989, and Toman 1994 (as noted in Toman, 1998).

generations, and does not look at the decision making procedures themselves, which may raise issues of fairness.

One of the ways to overcome the limitation of economic studies and information is to complement them with physical and social analysis, emphasizing the role of different alternatives and impacts over space and time. As Toman notes, there is a need for a broader framework where issues of uncertainty, irreversibility, and concern with the political process can be explored, in addition to costs and benefits of different alternatives. The approach should incorporate criteria from all the relevant disciplines.

The Environmental Impact Assessment as a Tool

In theory, an Environmental Impact Assessment (EIA) is a tool to predict impacts of proposed projects that provides an integrated environmental, economic, and social analysis, and discusses alternatives for project design, including no-build. One book recommended by professors in the University of Costa Rica on the role of the EIA in coastal areas is *The Coastal Zone Management Handbook*, by John R. Clark. The author argues that a preliminary EA should be first done to see whether potential serious impacts are likely (Clark, 1996, pp. 33). In Costa Rica, this analysis must be prepared by a consultant on a pre-approved list in the National Environmental Technical Secretariat (SETENA), at the developer's cost. Based on this study, if the impacts are likely to be high, a more detailed assessment must be submitted.

We can think of an EIA framework that includes economic, environmental, and social issues at two levels: a) the project level; b) the broader municipal or regional level (more levels

could be added as relevant). The framework should also include a time variable to differentiate short term vs. long term. An EIA should look at the following issues:⁹

- **Project description:** including the aspects that are expected to have the biggest impact, and alternatives, including no-build
- **Environmental Analysis:** This section provides information on potential impacts to key resources (water, soil, energy, and animal and plant components), and sets the ground to make a decision on potential mitigation measures and alternatives. This should be discussed with the relevant stakeholders. There should be screening of potential environmental problems (divided into major and minor), and scoping to determine levels of significance. This section should also provide the monitoring requirements¹⁰.
- **Economic Analysis:** This section should include (i) employment projections for construction and operations phases; including type of employment and required skills, and whether the local market can match these skills; (ii) ideally, an analysis of ecosystem services¹¹; (iii) financial costs and benefits to the municipality (costs may include improvements to local services such as water and electricity, and benefits may include increased property tax revenue); (iv) a short terms vs. long term analysis.
- **Social Analysis:** The goal of this section is to provide information on the likely social impacts of the project, such as for example demographic, livelihoods and culture changes. Tourism projects should mitigate the impact they can have on local resources, such as fisheries, particularly in areas where this is part of the population's livelihoods (Clark, 1996, pp. 429). At the same time, if adequately managed, the project can bring new opportunities without necessarily displacing current livelihoods.

It is important to view every proposed project as a component of a larger system, such as a watershed. Although the project proponents may be committed to taking mitigation steps to avoid potential harmful effects on the immediate environment and the local community,

⁹ This framework draws mostly from the seven-step procedure (STEPS) in Clark (1998). In some sections, such as the economic part, I have added other criteria.

¹⁰ It is common to have checklists to rate impact significance. SETENA has a form (called D1) that ranks potential impacts, the sum of which then determines if an EIA is needed.

¹¹ The ecosystem services analysis is complicated by the fact that many ecosystem services are not priced in the market, thereby making it difficult for cost and benefit analysis to truly reflect their value. There are also many externalities in these systems, which make it important to look beyond the immediate area of the project. Tools such as contingent valuation and willingness to pay can complement the more common net present value and cost benefit analysis.

project impacts may extend beyond immediate borders. For example, tapping into groundwater to provide a project with potable water may seem reasonable from a project standpoint, but may have detrimental consequences to other users who may experience reduced water availability, or the potential of saltwater intrusion in the aquifer. What is the carrying capacity of the larger area, and how does the decision about whether to proceed with a project take larger regional needs and impacts into account? For example, in an effort to account for broader issues, the National Technical Environmental Secretariat (SETENA) gives a higher (more penalty) score to projects in areas where there is no land use plan.

The specifics of what an EA or EIA should include are very context specific, and these documents often fail to specify special environmental protection actions that need to be taken¹². EIAs, like other tools such as Life Cycle Analysis, Cost Benefit Analysis, have a common set of problems that emerge when experts try to use analytic tools to make decisions. What is the scope? What data and what indicators should be used? How should we deal with uncertainty and complexity? What about time and budget constraints? Choices must be made at all levels. How does an organization deal with these? This question must be asked at each step (L. Susskind, 11.601 lecture, Introduction to Environmental Policy and Planning, Fall 2009).

The literature on the theory and practice of EIAs and sustainable development has proposed useful integrated sustainability decision criteria and general trade-off rules (Kemp et al., 2000; Gibson, 2001; Glasson et al., 2005; Emberton and Therivel, 2009) . The criteria area: socio-ecological integrity, livelihood sufficiency and opportunity, intra and inter-generational

¹² Clark notes that the person conducting an EIA is “a diagnostician and detective, not just a data compiler... an EIA is judged by the accuracy with which it identifies significant impacts and suggests practical countermeasures” (Clark, 1998, pp. 59).

equity, resource maintenance and efficiency, socio-ecological and democratic governance, precaution and adaptation, immediate and long term integration. This literature also proposes the following trade-off rules: maximum net gains, burden of argument on trade-off proponent, avoidance of significant adverse effects, protection of the future, explicit justification, and open process. I will argue that these are some of the criteria that should be used to analyze the EA/EIAs in the next chapter.

Despite the limitations with EIAs, they can be helpful. The next section will introduce sustainability in Costa Rica, and will examine the norms, rules, and regulations that currently form the EA/EIA process and sustainable development framework. The case studies in Chapter 3 will provide a glimpse of how the EA/EIA works in practice in Costa Rica.

Sustainable Development Decision-Making in Costa Rica

Costa Rica claims to take sustainability seriously and has been recognized around the world for its system of national parks. In fact, the country was ranked third among 163 countries in the 2010 Environmental Performance Index (EPI) produced by Yale University and Columbia University biannually, only behind Island and Switzerland, and ahead of Sweden (The Tico Times, 2010; Environmental Performance Index, 2010).¹³ This small, middle-income country of 50,000 km², 4.5 million inhabitants, and income per capita of US\$11,143 (Purchase Power Parity, 2008 dollars) has managed to put 23.4% of its territory under conservation

¹³ The Environmental Performance Index 2010, webpage notes that: "The 2010 Environmental Performance Index (EPI) ranks 163 countries on 25 performance indicators tracked across ten policy categories covering both environmental public health and ecosystem vitality. These indicators provide a gauge at a national government scale of how close countries are to established environmental policy goals." Indicators cover issues of ecosystem vitality and environmental health.

(UNDP, 2010; Earth Trends, 2003). Life expectancy is 79.1 years, and the adult literacy rate is 96.3 (INEC, 2002).

As Paul Steinberg notes in his book, *Environmental Leadership in Developing Countries*, the efforts that Costa Rica has made in environmental management should not be underestimated (Steinberg, 2001). In the 1980s, the agricultural frontier was rapidly moving and Costa Rica had one of the highest rates of deforestation in the world. Reversing this trend has been an incredible achievement that has also allowed the country to position itself in the eco-tourism community. Costa Rica now receives on average two million tourists a year (INEC, 2009). But the country has paid less attention to areas outside of national parks. One of the sustainability challenges at present is adequately managing the rate of urbanization in coastal areas.

The areas of most growth in terms of meters squared of construction are the Chorotega Region (where two of the case studies are located – Hotel RIU, and Vista Perfecta Phase II Apartments), and the Central Pacific (where the third case, Marina Pez Vela, is located). The main drivers of this growth are tourism and real estate projects. The Chorotega region jumped from representing 6.32% of total construction coverage in the country in 2003 to 19.83% in 2006, while the Central Pacific went from representing 7.23% to 14% of the construction coverage (*Estado de la Nación*, 2007, pp. 9).

The Permit and EA/EIA Process in Costa Rica

The process that a developer has to go through to get a permit varies depending on the project (e.g. marina vs. apartment building), but in general the main process to get a approval

for development in a coastal community of Costa Rica is the following (in very summarized form): 1) The first step is to present a copy of the design and studies for the project, including the cadastre map, to the Land Register Office (*Registro Civil*). 2) Copies should also be given to the municipality, including certificates of property, and a basic analysis of the impact on local services (garbage collection, electricity, water, etc.). 3) At this point, the developer should begin the environmental permit process with the National Environmental Technical Secretariat (SETENA).¹⁴

If the project lies in the Maritime Terrestrial Zone (ZMT), it must also apply with the National Institute of Tourism (ICT) and the municipality for a concession.¹⁵ If it is for a property less than 300m², the developer only needs to seek permit from the Ministry of Health and the municipality (although it should abide by construction codes dictated by Institute of Urbanism and Housing, INVU). For condominiums and other urbanizations, the developer must seek permit from INVU, the National Water and Sewers Agency (AyA), the Ministry of Health, and the municipality (*Estado de la Nación*, 2007). There is no shortage of requirements, laws and regulations, and many developers complain about this. The next section will go over some of most relevant laws for coastal development.

Relevant Laws and Regulations

The following section will provide a snapshot of the main laws applicable to development in coastal areas. According to the urban planner interviewed the issue with the

¹⁴ For more detailed information on this process, see *Estado de la Nación*, 2007, pp. 23-30.

¹⁵ According to the ZMT Law, no person or family can hold more than one concession. In practice though, people have been applying for concessions through incorporated societies (*Sociedades Anónimas*). This has led to speculation over concessions.

environmental framework in Costa Rica at the moment is more about implementation rather than the laws themselves. He mentions that the two are disconnected. For example, there are huge laws that do not apply because there are no regulations, and there are other older laws (e.g. the Water Law) that have such low values stipulated for the fines that people have no incentive to comply. Nevertheless, he considers that having high goals stated in the laws provide steps for actors such as the Environmental Administrative Tribunal (TAA) to do the right thing (urban planner, personal communication, January 2011).

The following four laws provide a basic understanding of the sustainable development framework in Costa Rica, as it applies to coastal development:

1. The Constitution

Article 50 of the Constitution says that every person in the country has the right to live in a healthy and ecologically sustainable environment, and the duty to conserve it.

2. The Environmental Law (Ley Orgánica del Ambiente, N°7554)

One of the steps in which the government seeks to safeguard the right to a healthy environment is through the environmental impact assessment process. The issue of environmental impact assessment is in articles 17 to 24 of the Environmental Law. According to this law,

“All human activities that alter or destroy elements of the environment or that generate residue, toxic or dangerous materials, are required to submit an **environmental impact evaluation** to SETENA, the approval of which is an indispensable requirement to initiate the relevant activities or projects. Evaluations must be done by an interdisciplinary team, registered with and authorized by SETENA, and in conformity with the guidelines provided by the institution. The developer must pay for these studies. SETENA’s decision must be reasoned and sound” (Environmental Law, *Ley Orgánica del Ambiente*, author’s translation).

The environment law also empowers SETENA to establish procedures and methods to monitor compliance with environmental regulations, and gives the agency the authority to stop any project if necessary. The developer must deposit in an account in SETENA a “Guarantee of Compliance” of up to 1 percent of the project investment. A file is then opened in SETENA for the project, and this file is public. Depending on the potential impact, the activity is categorized as A, B1, B2, or C, C being the lowest potential environmental impact. Activities in the C category must submit a simple form to SETENA (called D2). All documents to SETENA are also given to Municipalities (DEMUCA, 2001, pp. 172).

The Environment Law also establishes the Environmental Administrative Tribunal (TAA). The TAA receives environmental complaints, and has expanded its action by conducting “environmental field visits/audits” that already have closed several projects that were in non-compliance. Chapter 5 will discuss the TAA in more detail, since this is an important agency that is helping to keep projects in line with the law and with the environmental commitments acquired during the process with SETENA.

3. The National Environmental Technical Secretariat (SETENA) Procedures

The first step in the SETENA process is to apply for a Request of Environmental Feasibility (*Solicitud de Viabilidad Ambiental*) through either a D1 or D2 form, depending on the project and potential impact. A fee must be paid to submit either form, and a consultant is needed to complete and submit the D1 form. Any activity in the C or B2 category and located in an area where there is a Land Use Plan approved by SETENA is defined as a low potential environmental impact activity, and is therefore processed through the simpler D2

Environmental Evaluation Form. Regardless of the category, all projects should have a technical instrument that dictates the best environmental practices to be followed by a developer (CBPA - *Código de Buenas Prácticas Ambientales*).¹⁶

The D2 form is a very basic four-page document. The issues are divided into consumption (such as water and energy), and impact (e.g. impact to water through wastewater and runoff). It provides thresholds such as: “is water consumption estimated to be greater than 50m³/month, which is the average for a household,” or, “is estimated energy consumption greater than 240 Megawatts per hour (MWh) per year, which is the average for a household” (SETENA, 2004, pp.4).

Larger projects must undergo the D1 process, which although similar to the D2 in terms of the thresholds and categories described above, covers many more categories and is more specific. The D1 form has the same categories as the D2 form, namely consumption, impact, and other risks, but is more extensive and uses a formula to calculate the results of the evaluation (an excerpt of the D1 form is shown in Appendix 1). According to SETENA's procedures, if the D1 results in a score of 300 or less, the project needs to submit a Declaration of Environmental Commitments (*Declaración Jurada de Compromisos Ambientales*). If the D1 score falls between 300 and 1,000, the project needs to submit an Environmental Management Plan (*Plan de Gestión Ambiental*, PGA) that needs to be reviewed by SETENA before the permit is given (DEMUCA, 2005, pp. 174). For projects with a score greater than 1,000, an EIA is needed. The case studies in this thesis each cover one of the possible documents: the Vista

¹⁶ The CBPA establishes actions to prevent, correct, mitigate, and/or compensate for any damage to the environment. SETENA notes that the document should be considered by the environmental consultant and the analyst responsible for examining an environmental impact evaluation. (SETENA, 2004).

Perfecta Phase II Apartments was required to submit a Declaration of Environmental Commitments; Hotel RIU a PGA, and Marina Pez Vela an EIA.

According to Decree 32967 from the Ministry of Environment (MINAET), land use plans also need the approval of the National Environmental Technical Secretariat (SETENA) through a methodology called the Environmental Sensitivity Indices (IFAs—*Índices de Fragilidad Ambiental*). The IFAs apply the environmental assessment methodology discussed above in the SETENA section (for projects) to land use plans. Each proposed land use, from agriculture to industrial, is analyzed according to its potential impact on air, soil, water, flora and fauna, natural hazards, cultural resources, and existing communities. The analysis follows a matrix methodology to score the impacts in the same fashion as is done for projects. The urban planner interviewed noted that although in theory having the IFAs is a good idea, the fact is that the analysis is too complex, and the methodology is out of touch with the capacity in the country to implement it. At the same time, he notes that SETENA could be stricter when reviewing proposals (Urban Planner, personal communication, January 2011).

4. The Municipal Code (Código Municipal, Ley N°7794)

Any project must have a municipal license for the works to start. According to the Municipal Code, articles 79 and 81, the municipality should consider the activity's conformity with the land use plan (*Plan Regulador*) and zoning currently in force in the area. This is independent from the construction permit that the municipality is also responsible for issuing. Municipalities can condition permits and licenses to compliance with the regulations in the General Health Law and other related legislation regarding pollution and natural resources (DEMUCA, 2001, pp. 173). Note that despite these regulations, most coastal municipalities are

just now in the process of creating their first land use plan, an effort mainly driven by the National Government. The fact is that there is very limited capacity and resources for land use planning on the ground.

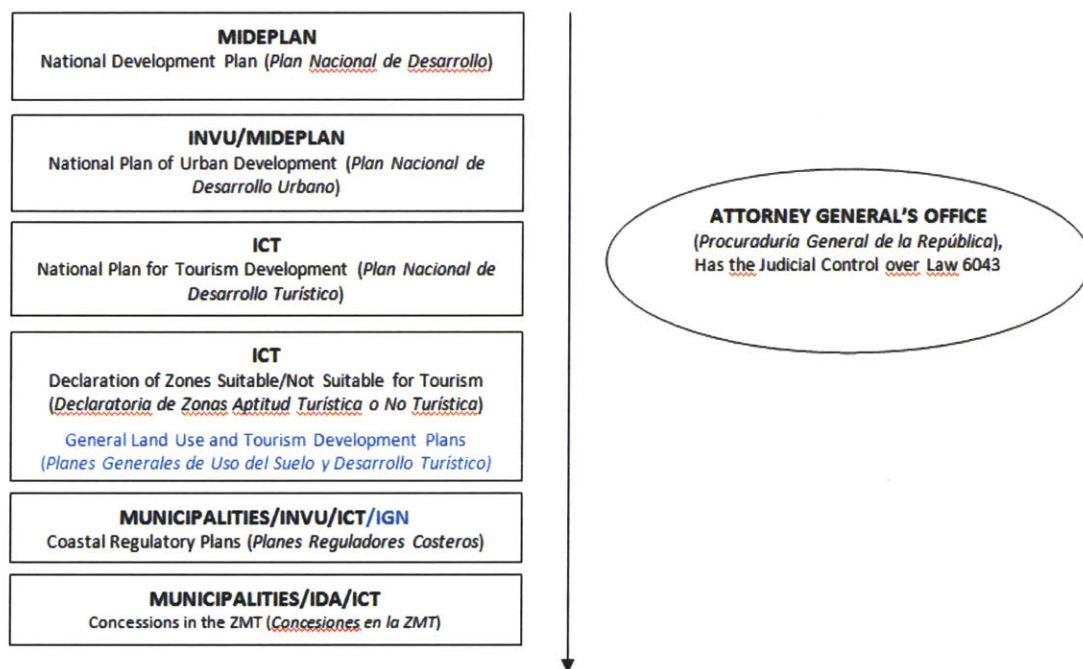
5. The Maritime Terrestrial Zone Law (Ley de la Zona Marítimo Terrestre, LZMT, N° 6043)

The Maritime Terrestrial Zone Law (LZMT) regulates development in the first 200 meters of shoreline after the high tide watermark (Cabrera, 2009). According to the LZMT, the most recent version of which was passed in 1977, these 200 meters are State owned land. The first 50 meters are public and cannot be built on (except under certain exceptions if it is for a public use project such as a seafront), and concessions can be granted in special circumstances to private developers in the next 150 meters. The general knowledge is that coastal towns and cities such as Quepos (where Marina Pez Vela is located) are excluded from this law, as are Conservation Areas, which are covered under another set of regulations. Nevertheless, the LZMT does not spell out clearly this understanding regarding towns and cities, so projects impacting the ZMT in a place like Quepos have to apply for a ZMT concession.

Most people consider the LZMT to be beneficial, particularly because it provides some measure of protection to coastal ecosystems. However, there are some who would like the government to make changes to this law in order to make concessions easier to obtain (but at least two interviewees mentioned that this is not likely to happen). What most interviewees recommended instead was to make changes to the regulations in order to reduce complexity, and to make the law easier to implement. The complexity of the LZMT is also noted in the 2005 document by the Foundation for Municipal and Institutional Development in Central America and the Caribbean (DEMUCA), which notes that “to suppose that good implementation

methods can be obtained from the simple reading of Law 6043 is to fail to recognize that there exists a whole related legal framework and a series of criteria emitted by the different organizations and institutions that complement the understanding of the legal framework in force” (DEMUCA, 2005, pp. 210). Figure 2.1 below depicts the most important institutions in charge of applying the LZMT.

Figure 2.1: Institutions and Planning Instruments Involved in Coastal Land Use Plans



Source: Figure directly taken from DEMUCA, 2005, pp. 151 (author’s translation). Note that MIDEPLAN refers to the Ministry of National Planning and Political Economy, IGN to the National Geographic Institute, and IDA to the Costa Rican Agrarian Development Institute. The additions in blue are not in the original figure.

In theory, The Ministry of Planning and Political Economy (MIDEPLAN) sets policy goals in the National Development Plan (PND) that should in turn find a physical manifestation through the National Urban Development Plan (PNDU). The Legal Specialist interviewed said that this plan does not exist. It is only now in the process of being developed by the Ministry of Housing and Urbanism (INVU), and INVU has focused mostly on San José and the other

provinces that make up the Metropolitan Area of Costa Rica (GAM) (Legal Specialist, personal communication, January 2011). The Tourism Institute (ICT) has been more proactive in developing planning instruments for coastal areas. In 2001 it published the 2002-2012 Plan for Tourism Development (PNDT) that divided the country into ten tourism planning regions, and developed what are called the General Land Use and Tourism Development Plans, at the 1:25,000 scale for each of the ten regions. These are maps (not regulations) meant as guidelines, and the main goal of these plans was to establish “tourism poles” of more density.

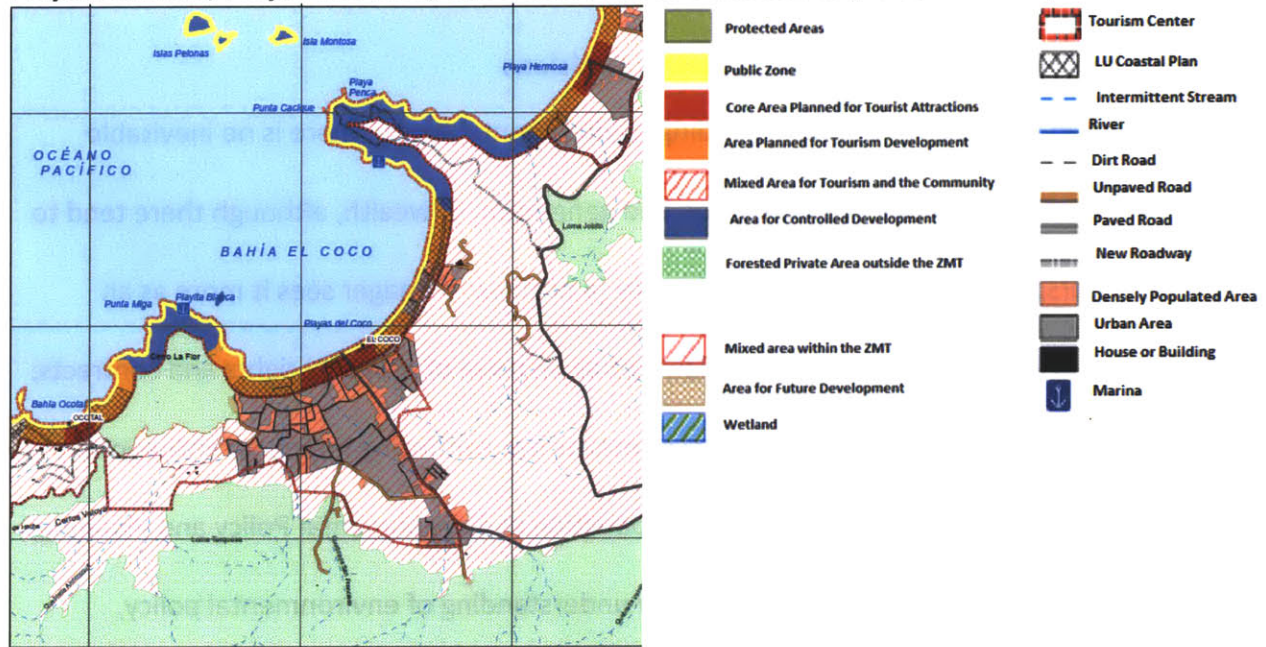
There is disagreement among interviewees about the usefulness of these plans though. On one hand, they provided a more macro perspective (Figure 2.2 below is the Plan for Playas del Coco). On the other, the environmental specialist interviewed mentioned to me that these plans are not very useful in practice and do not have “teeth”, mainly because the regulations to guide development have to be established in a land use plan (*Plan Regulador*). These are the plans currently being developed.¹⁷ The ICT is developing seven of the Regulatory Land Use Plans, while the Cadastre Project and the Program on Sustainable Urban Development (ProDUS) are developing the plans for the rest of the Pacific Coast.

A Coastal Regulatory Land Use Plan (*Plan Regulador Costero*) is technically required before a concession can be granted in the ZMT. Many of these plans are only now being

¹⁷ Other relevant laws and regulations that apply to coastal development are the Urban Planning Law (*Ley de Planificación Urbana*), the Environmental Sensitivity Indices (IFAs), the Law of Constructions and its Regulations (*Ley de Construcciones y su Reglamento*, N° 833), the Law of Condominiums (*Ley de Condominios*, N° 7933), Regulations for the Control of Land Subdivisions and Urbanizations (N° 3391, INVU), and the Forest Law (*Ley Forestal*, N° 7575). In addition to the respective municipality, the Tourism Institute (ICT), SETENA, and the Ministry of Housing and Urbanism (INVU), other institutions involved in coastal areas and the ZMT in particular include the Ministry of Health, the Ministry of Environment and Telecommunications (MINAET), the Land Registry (*Registro Civil*), the Ministry of Public Works and Transportation (MOPT), the Costa Rican Institute of Agrarian Development (IDA), and the Attorney General of the Republic (*Procuraduría General de la República*).

developed. Until recently, much of the development in the ZMT has been approved with land use plans proposed by the private developers, but this practice was stopped recently by the Attorney General’s Office (PGR) because of the many problems encountered.

Figure 2.2: ICT’s General Land Use and Tourism Development Plan for the 200-Meter Zone of Playa Hermosa, Playas del Coco, and Bahía Azul in Guanacaste (1:25,000 scale)



Source: Costa Rican Tourism Institute (ICT), National and General Plans (author’s translation of map key). Map accessible from: http://www.visitcostarica.com/ict/paginas/modEst/estudios_estadisticas.asp?idIdioma=2

The urban planner noted in his interview that Costa Rica “fell asleep” on matters of coastal planning (and urban planning more generally), despite having the laws in place. In his view, land use plans are the regulations applied to the local level, in this case for the ZMT. Without these regulations, there has been ample room to misinterpret the LZMT. Correcting these issues has been a legal battle (“*un parto legal*”) of ten to five years. The country was prepared in theory for the international investment, but the fact is that it really was not (urban planner, personal communication, April 2011).

The above discussion shows that land use planning has only recently taken off in Costa Rica, so efforts are isolated and constrained to certain institutions and sectors. As will be discussed below, overcoming these institutional and interdisciplinary silos is one of the most important steps towards improving the sustainable development framework.

Breaking the Silos and Learning to Make Better Decisions

As noted by S. Cohen in *Understanding Environmental Policy*, there is no inevitable trade-off between environmental protection and generation of wealth, although there tend to be differing perspectives on environmental policy (a business manager sees it more as an impediment; an engineer as a physical fix; lawyers as an issue of property rights and contracts; economists think of market failures; political scientists see conflicting interests; philosophers look at values) (L. Susskind, 11.601 lecture, *Introduction to Environmental Policy and Planning*, Fall 2009). Cohen notes that an interdisciplinary understanding of environmental policy, science, engineering, economics, business, and organizational management works best. It is important to apply different vantage points when assessing environmental problems because each comes with its own set of values. And the fact is that decision-making is inherently political.¹⁸

One of the most promising ways to achieve sustainable development is to complement basic regulations and inter-disciplinary efforts with a process in which experimentation and learning can open new ways of thinking and doing. If we take the case of coastal development

¹⁸ As Toman's piece for RFF notes, "...in this approach, the policy decision ultimately will rest with the judgment of the decision-makers, and thus will be inherently a political question" (Toman, pp. 6). I would add to this that different stages of the planning process (EIA, land use plans, national development plans, etc.) should also work together in a more coordinated and consistent form.

for example, sustainable development will be more likely if the developer abides by some norms of corporate social responsibility and sustainable practices. The government should have a regulatory process conducive to sustainability, and the proper checks and balances to make it happen. Non-governmental organizations have a very important role in providing technical capacity, and can join civil society in being important watchdogs. The community is the most important, yet often unheard, voice in the process. This thesis focuses mainly on the role of the EA/EIA process, although it acknowledges that the EA/EIA is embedded in a bigger framework, and that it is more of a “necessary but not sufficient” tool for sustainable development.¹⁹

Looking at the Sustainability Framework in Costa Rica in Practice

A sustainability framework should integrate different disciplines and values, and find common ground to achieve better outcomes. Ideally, the framework should provide a process through which it is possible to 1) look at the problem from different sides (economics, science, etc.), 2) at different scales (project level, region, nation, etc.), 3) at different times, and 4) with different levels of intervention (state, market, community). The process should make it possible to make well-informed decisions and tradeoffs. Beyond this, the key is to enable a learning process to improve on it. We need to put in place policies (and criteria) through which we can constantly evaluate progress, and build on current processes. Participation is a fundamental part of this process.

¹⁹ Because of the common property nature of coastal resources, the case for government intervention is clear. But it is also important to remember the arguments of Ostrom for example (*Governing the Commons*, Chapter 1). Her point is that neither the State nor markets are uniformly successful; there are examples of communities being more successful over time. She notes that individually rational strategies, paradoxically, often lead to collectively irrational outcomes (Ostrom, year).

Despite Costa Rica's efforts in sustainable development, the cases in Chapter 3 will reveal that the framework currently in place for environmental assessment of coastal development projects is not conducive to sustainability. As it stands, the process is being used more as a bureaucratic procedure than an opportunity to pursue projects that are in the public interest. In addition, despite its effort, SETENA does not have the capacity or resources to keep up with the responsibility it is facing with the increase in applications. On the positive side, land use plans are being developed, EA/EIAs regulations are being discussed, and there is a sense of urgency. A policy window might be opening for the sustainable development of coastal areas.²⁰

²⁰ There are many lessons from other regions that have also been dealing with the pressure of coastal development, such as Hawaii. One of the lessons from Hawaii's experience is that it is very difficult to do sustainable development if each sector keeps to its own (NOAA Coastal Zone Management). There is a need for more systems thinking, such as through the umbrella of Coastal Zone Management.

Chapter 3: Case Studies

The three case studies presented in this chapter are projects in the tourism and real estate sector in Costa Rica. Each project had to undergo an environmental evaluation with the National Environmental Technical Secretariat (SETENA) and generated a project file that is accessible to the public. As discussed in the previous chapter, SETENA must determine whether a project needs to submit a Declaration of Environmental Commitments, an Environmental Management Plan, or a more in-depth Environmental Impact Assessment (EIA). Of the three cases, the real estate project was required to submit a Declaration of Environmental Commitments, the hotel an Environmental Management Plan, and the marina an Environmental Impact Assessment.

Before digging deeper into the environmental concerns surrounding each case, let me first recap why tourism and real estate development are so important in coastal areas of Costa Rica.

The Context: Economic and Social Indicators in the Chorotega and Central Pacific Regions

Appendix 2 shows percentage of total employment in the Chorotega (Guanacaste) and Central Pacific Regions that can be attributed to the tourism and real estate sectors, as measured in the National Accounts, for the Construction and Commerce, Hotels and Restaurants category. In the case of the Chorotega Region (Guanacaste Province), total employment increase by 19.80% during the period from 2001 to 2008. During this same period, employment in construction increased by 73%, and employment in commerce increased more modestly, by 3.54%. The Central Pacific Region (Puntarenas Province) saw an increase of 19.48% in employment from 2001 to 2008, while construction increased by 43.75%, and

commerce decreased by 4.23% during this period. The losing sectors have been mainly agriculture and fisheries, but also manufacturing and mining in the case of the Central Pacific Region.²¹

Both the Chorotega and the Central Pacific Region have historically had higher poverty rates than the country's average. There has been a considerable decrease in extreme poverty from 2001-2009 (37.90% for the Chorotega Region and 48.62% for the Central Pacific Region), and the Chorotega Region has seen a decrease in the amount of people without basic needs met (13.23%).²² This is not the case for the Central Pacific, where the population without basic needs met has increased by 9.57%.

It is important to keep in mind that in contrast to other areas of the world where major cities are located in the coast, Costa Rica's coastal areas have not been at the center of the country's development in the last century. The capital, San José, is located in the central plateau (*Meseta Central*) and harbors 63.9% of the population (close to 3 million out of the country's total 4.5 million) and 90% of the industrial production in the country (MIDEPLAN, 2009). The Chorotega Region has 7.6% of total population, and the Central Pacific has 5.3%. Except for the international ports in Puerto Limón (Huetar Atlantic Region) and Puerto Caldera (Central Pacific Region) coastal areas have received less investment in infrastructure and even these ports are lagging behind very significantly in terms of investment²³. It is therefore

²¹ However, these measures may not be capturing total local job growth accurately, since many jobs are being met by immigration from the capital city San José and from neighboring Nicaragua (*Estado de la Nación*, 2007). Population in the Chorotega Region grew by 11.38% during this period, and in the Central Pacific by 15.77%, compared to 15.77% for the country as a whole, according to INEC statistics (MIDEPLAN, 2009).

²² Note that these statistics may be overestimated by the fact that many professionals moved to the coast during this period (e.g. lawyers and engineers).

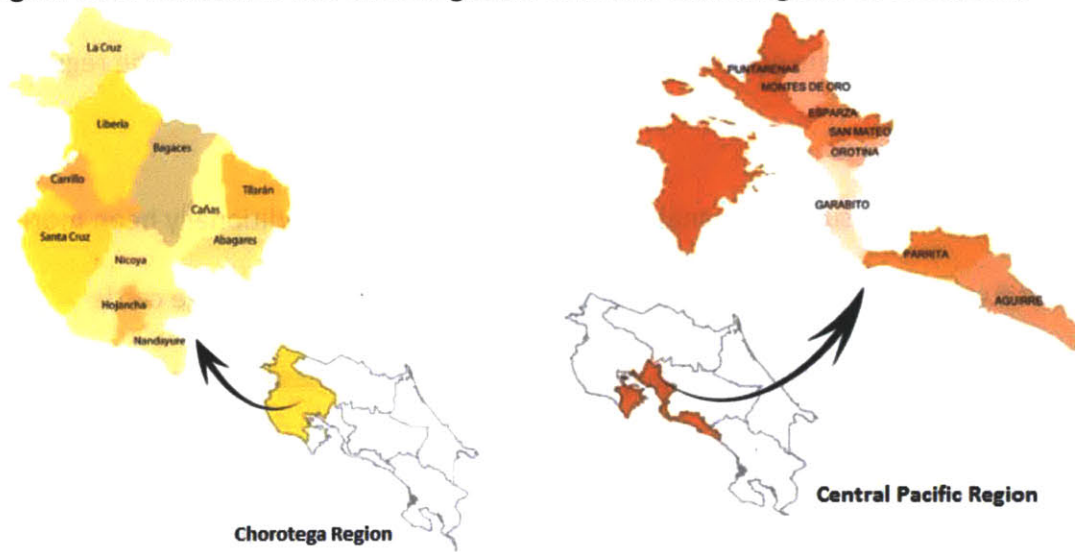
²³ The poor performance of the Limón-Moin complex has been analyzed extensively. Comparisons of service indicators for this port complex—where 90% of Costa Rica's sea container traffic is concentrated—are clearly

noteworthy that the Chorotega Region received the most public investment in airports for the period 2001-2008, attesting to the government interest in tourism development in the region (MIDEPLAN, 2009).

In the North Pacific such as Guanacaste, land ownership has traditionally been more unequal (the "*latifundio*" type) than in the rest of the country, dominated by large cattle ranching farms and plantations of sugar cane, rice, and melons. There have been some efforts to distribute land and encourage small farmers to grow products for local consumptions such as beans and rice, led by the Costa Rican Institute for Agrarian Development (IDA) and more recently as a result of the increase in food prices. In general, wages are lower in coastal areas than in San José, and the economy is very vulnerable to fluctuations in international markets and climatic conditions. In the Central Pacific, areas such as Quepos saw a loss in jobs when the United Fruit Company closed operations in the country. With the recent changes in coastal communities, many farms are being subdivided and sold to developers to become hotels, golf courses, and apartment buildings. The typical field worker is now selling watermelon and coconut water to tourists, and his sons and daughters are servers in the restaurants or hotels. They are learning English and their world is changing. Figure 3.1 shows the two regions in context to the map of Costa Rica.

unfavorable. Most of the movement of containers between ships and the docks is conducted with ship cranes, rather than port cranes. Occupancy rates have been very high (around 75%, and close to 90% at the docks most in demand), which translated into an average 13.6 hour wait time per ship in 2007 (World Bank, 2009).

Figure 3.1: Location of the Chorotega and Central Pacific Regions of Costa Rica



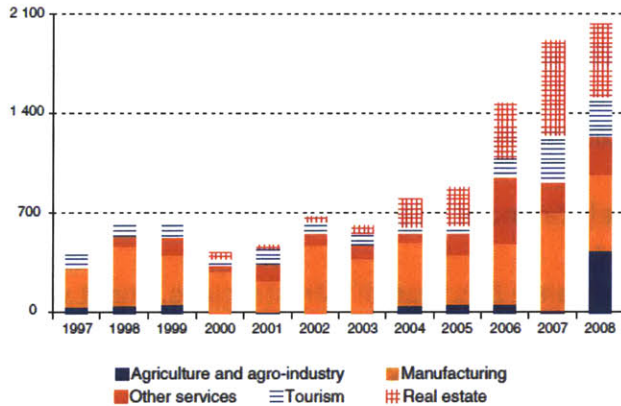
Source: Maps from MIDEPLAN, 2009.

Tourism and Real Estate Investment in Costa Rica

According to a study from the Economic Commission for Latin America and the Caribbean (ECLAC), tourism and real estate projects accounted for close to 30% of foreign direct investment (FDI) in Costa Rica between 1997 and 2007. Figure 3.2 below shows how real estate and tourism have become a very significant component of FDI in the country. The financial newspaper in Costa Rica, *“El Financiero,”* notes that more than one million square meters were constructed in Guanacaste during 2006. This represents an increase in construction of 21 % over the previous year for the entire country, and an increase of 66% in that region alone (Roman, 2007). In 2007, it was forecasted that 10,000 units would be constructed in the next 20 years. The economic downturn has decreased this investment, but there are signs of recovery (Roman, 2007). One of the interviewees said that it will take a while for investment to come back to Costa Rica because investment in the USA will come first, so the country will have to wait till that market comes back (Real Estate Specialist,. personal communication, January

2011). This is good and bad, good because it gives more time for the country to catch up in its effort to better plan the growth of coastal areas, and bad because these kinds of investment are part of the country’s current economic growth agenda.

Figure 3.2: Foreign Direct Investment in Costa Rica by Economic Activity, 1997-2007 (millions of dollars)



Source: ECLAC, 2008, pp. 129.²⁴

According to the Central Bank of Costa Rica, “much of this investment corresponds to purchases by foreign citizens of housing, land, condominiums and commercial properties, mainly in Guanacaste and Puntarenas” (ECLAC, 2008, pp. 129).²⁵ The ECLAC makes its own assessment of the situation, cautioning the country that the lack of planning can cause “problems of land management, natural resources, and environmental quality, particularly in relation of the management, quality and use of drinking water, earth movement, changes in land use and production and management of solid waste” (ECLAC, 2008, pp. 129). Without adequate planning and guidance of these developments, there is fear that coastal areas will

²⁴ The report notes that the source for the information is the Central Bank of Costa Rica. Note the large increase in foreign direct investment in agriculture. This is mainly due to investment in pineapple plantations.

²⁵ Roman 2007 notes that over 50% of the projects have American partnerships.

develop in a disorganized fashion. ECLAC states that the proliferation of golf courses is worrisome in Guanacaste, where water is scarce during the dry period.

The ECLAC study is right. To be fair though, the fact is that the public sector has not been able to accompany these private investments with the necessary investment in public infrastructure such as sewer systems and water treatment plants, aqueducts, and roads. The private sector has been stepping in to fill this gap, but there have been conflicts in certain cases over how this should be done. The third case study in this chapter illustrates this conflict as evidenced by the protests over the privately financed Coco-Ocotol water aqueduct. More and more, the government will not be able to finance this type of infrastructure, and it will need to engage in more public-private partnerships. Therefore, my stance is that the private sector should be brought in to help these investments (especially since the Water Law (*Ley de Aguas*) says that the infrastructure then becomes public), but there should be capacity at the national and local level to do this well. For example, water studies should determine the right amount that can be exploited from the aquifer, and the National Water and Sewers Institute (AyA – *Acueductos y Alcantarillados*) should be smart about how it engages in these contracts in terms of maintenance needs and budget, for example.

The following sections will show how these investments have been playing out in practice, and whether the right tradeoffs between economic, social, and environmental issues have been made. The tool for this analysis will be the Environmental Assessments or Environmental Impact Assessments of three projects in the Pacific Coast of Costa Rica.

Recapitulate the Framework for Analysis

An Environmental Assessment (EA) should make it possible to 1) look at the likely effects a proposed project will have – from numerous perspectives (economic, social, ecological), 2) at different scales (project level, region, nation, etc.), 3) at different times (short term, long term), and 4) where mitigation measures can come from different levels of intervention (e.g. state, market, community). The process should make it possible to make good and informed decisions and tradeoffs. There should be alternatives, including no build. Beyond this, the key is to enable a learning process to continually make improvements.

Despite Costa Rica's efforts in sustainable development, the framework currently in place for environmental assessment of coastal development projects is not conducive to sustainability. As it stands, the process is being used more as a bureaucratic procedure than an opportunity to pursue projects that are in the public interest. The three case studies below will illustrate particular strengths and weaknesses of the process.

The Three Case Studies

I. Case Study 1 – Hotel RIU

Hotel RIU, a six-floor hotel of 700 rooms located in Playa Matapalo (Municipality of Carrillo, Guanacaste), opened on October 30, 2009 amid many controversies concerning the construction process (*La Nación*, October 30, 2009). On November 2008 the Ministry of Health closed construction of the project for five days after the death of a worker who had symptoms of diarrhea, vomiting, and respiratory problems (*La Nación*, November 25, 2008). Two hundred other workers also presented these symptoms. In addition, legal complaints (*Recurso de Amparo*) were filed by the organization *Confraternidad Guanacasteca* and the Tempisque

Conservation Area for, among other things, damages to mangroves and encroachment of demarcated natural areas. The Supreme Court of Costa Rica (*Sala Cuarta*) accepted to pursue these complaints (*Costa Rica Hoy*, July 10, 2009). The Environmental Administrative Tribunal (TAA) also investigated the project. Despite these objections and the media coverage, there is no evidence of a trial or any fine imposed on the developer. Therefore, there seems to be opportunity to object to environmental, health, and other issues in Costa Rica, but it is not so clear that anything gets done about it. In order to prevent and mitigate the health impacts of projects, the EA of this project should have been able to address these issues ex-ante, and the agency in charge of monitoring compliance with the EA should also have flagged non-compliance.

Interviewees expressed concern with projects such as Hotel RIU and noted that Costa Rica should try to keep these at a minimum. These are large hotels that leave in the community just a small fraction of the earnings generated by the development (Figueroa, 1995; Pratt, 2002; ProDUS, 2010; PNUMA, 1998). In terms of environmental costs, such large projects in areas of low density, mangroves, and undeveloped basic service provision pose a risk to their environmental integrity.²⁶ The developer owns a total of 322 hectares in the area, of which 10.5 are in the concessional Maritime Terrestrial Zone (ZMT) and another 33.3 are in the public (and non-concessional) ZMT. Five hectares were used for Hotel RIU's buildings, and 19 hectares total for the development. The developer plans to build another hotel and several apartment buildings (Costa Rica Tourism, 2009). As the following paragraphs will highlight, this project is

²⁶ For an interesting video from the Era Verde Movement at the University of Costa Rica that shows a protest at Hotel RIU, see http://www.youtube.com/watch?v=u_bMwPyT2Sw

interesting because it shows some of the strengths and weaknesses with the sustainable development framework in Costa Rica. People are complaining about non-compliance of projects, and environmental awareness is growing among locals. There are legal processes in place for these complaints. But in the end, nothing happens. As Jose Lino, President of the Environmental Administrative Court notes, “There are good laws in place; the problem is in the implementation of the law” (*Costa Rica Hoy*, February 14, 2011).

Evidence

There were issues with the project of Hotel RIU starting from the environmental viability process in SETENA. First, instead of an Environmental Impact Assessment, the project was asked to undertake an Environmental Management Plan (PGA – *Plan de Gestión Ambiental*), a less-stringent review document.²⁷ Second, the analysis of the PGA by SETENA did not point out important technical issues. For example, studies backing hydrological statements in the reports don’t test for hydrologic conditions during the dry and rainy seasons, and SETENA does not push back. There are no questions asked regarding the type of treatments plants that will be used. Third, SETENA which is the agency in charge of monitoring the project’s compliance with the environmental commitments, is deficient and omits critical details (e.g. their report right after the death of the worker did not include a check on sanitary conditions in the worker area, and there is no mentioning of the worker’s death). Fourth, SETENA’s response to the legal

²⁷ According to SETENA, a PGA should include base studies (including field work and corresponding analysis) by all the participating consultants in the study, and a section of potential environmental impacts and proposed mitigation measures. As discussed in Chapter 2, the score on the D1 matrix determines the type of document that a project requires to process the Environmental Viability with SETENA. Projects scoring between 300 and 1000 points must submit an Environmental Management Plan (PGA).

complaint against the developer is dismissive and refers the issue to the respective line agencies. SETENA should have more responsibility in following up on these complaints.

In addition, the Environmental Management Plan (PGA) lacks interdisciplinary analysis. The assessment deals mostly with the physical aspects of soils (i.e. to analyze seismic risk) and hydrology (water consumption and wastewater). It breezes through economic and social aspects, only mentioning that the hotel will generate employment. This project-level assessment does not give much attention to its surroundings, e.g. the closest community, Nuevo Colón, or the ecosystem in Matapalo beach. As shown in the pictures, this project is the only big structure in the area and will impact the beach and the surrounding town. There is also no discussion of the impact on the municipality through taxes or service requirements. The assessment's focus is so narrow that there is no discussion (or adequate discussion) of the fact that there is another hotel and several real estate projects planned for the area.

The complaints and newspaper coverage mention that the project eliminated a small stream, in addition to mangroves and trees in the Maritime Terrestrial Zone (ZMT), which appear in the conservation maps in the Ministry of Environment (MINAET). There are also allegations that the developer and the municipality were planning on closing one of the public access roads to the beach in order to provide more privacy to tourists. The ZMT is "Patrimony of the State" and therefore none of these activities can be performed without the necessary concession and permits. The hotel was approved a concession by the Tourism Institute (ICT) and the municipality, based on the developer's plans and the Regional Land Use and Tourism Development Plan for Guanacaste's ZMT developed by the ICT. The pool and garden area of the

hotel are inside the concessional area of the Maritime Terrestrial Zone (ZMT). The Matapalo area does not have a land use plan (*Plan Regulador*).

Longer Case Analysis

Hotel RIU is a three-star hotel, at which all meals are included in the room price.²⁸ In addition to the main building, there is also a separate “services” area of three floors, where a large number of the personnel of the hotel live.²⁹ Hotel RIU is the first part of a tourism complex that will include more hotels, a Casino, SPA, and residential areas (see Figure 3.1 for images of the hotel). The developer bought 322 hectares of land in the area, of which 10.5 hectares are in the concessional area of the ZMT, and 33.3 hectares are in the public, non-concessional part of the ZMT. Land to be developed in this project is 5 Ha, including parking and an access road to the property. The footprint (impervious cover) is 109,429 m,² or 1,177,456 square feet. The project is expected to create 1,000 jobs during construction and 1,000 jobs during operation, and the cost of the investment is between US\$ 60,000,000 (according to the hotel’s PGA) and \$150,000,000 (Costa Rica Tourism, 2009).

The first step of the SETENA process is to submit the information requested in the D1 or D2 forms for a preliminary evaluation of the development’s potential impacts, known as Environmental Impact Significance (*SIA - Significado de Impacto Ambiental*). To obtain a project’s SIA, the first number needed is the total score from the D1 matrix (i.e. obtained basically by multiplying each impact by the pre-established level of significance). The value for

²⁸ The project developer is a corporation registered in Costa Rica. The environmental consultant is a Costa Rican firm. Note that the RIU firm is a Spanish Consortium that has hotels in places such as Florida, Dominican Republic, and Puerto Rico.

²⁹ There is also a convention center, a discotheque, several stores, an administration area, a laundry room, an electric and maintenance area, a machine room, and a sewage treatment plant.

Hotel RIU was 233,000. This number must be doubled in cases where there are no regulations for the type of project in question. In addition, the number must be weighted in terms of the land use planning in the area. In this case, the project is located in an area without a land use plan, so the number must be multiplied by 1.5.³⁰ Therefore, the final SIA classification is 699, and the project was required to do an Environmental Management Plan (PGA).³¹ A contradiction to notice at this point is that the developer submitted the D1 together with the PGA. The purpose of the D1 is to determine the Potential Environmental Viability (VAP – *Viabilidad Ambiental Potencial*), and the type of environmental impact evaluation needed. The D1 should have come before the PGA.

Chronology of Complaints Against Hotel RIU during the Construction Period³²

a) The Tempisque Conservation Area

The Tempisque Conservation Area³³ (a subregional office, which is part of the Ministry of Environment) noted to SETENA via a memo (dated February 22, 2008) that there were irregularities in the construction process of the hotel, and that therefore they were ready to submit a complaint to the Santa Cruz district attorney's office. Hotel RIU's construction phase, in their view, was in violation of the Forestry Law, the Mining Code, and the Environmental Law.

Their complaint flags construction at a 2-meter distance from the stream and in other areas at a

³⁰ If it were located in an area where there is a land use plan, approved by SETENA, the number should be multiplied by 0.5. If the project is located in an area with a land use plan but that is not authorized by SETENA, the number should be multiplied times 1. And if it is located in a protected or fragile area, it must be multiplied times 2.

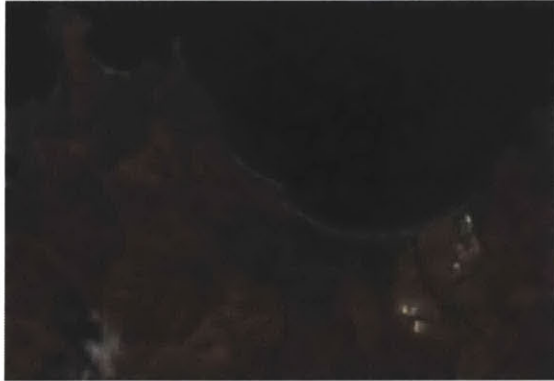
³¹ Note: If pick 2 for fragile area, which I would have said so because of such a big change the hotel will bring [mangroves, and reefs, and local community] comes to 932, it easily would have qualified for EIA. In fact, according to Glasson, any hotel bigger than 350 rooms requires EIA.

³² Information from the Hotel RIU D1 project file in SETENA.

³³ The Tempisque Conservation Area (*Area de Conservación Tempisque*), is a regional agency in charge of overseeing the health of the Tempisque River watershed, in particular to ensure that there is enough water for the dams in the Tempisque River. The agency is well positioned to comment on these issues. Nevertheless, SETENA does not seem to take its complaint very seriously.

1-meter distance, as well as trash deposited in the streams and latrines very close to the river. The memo also notes illegal cutting of trees, among which is a species that is illegal to cut, the “ron ron.”

Figure 3.1: Photos of Hotel RIU



Source: The images at the top are from Google Earth. The rest of the pictures are photographs taken by the author in 2011.

b) Investigations by the Environmental Administrative Court (TAA)

A formal process was initiated in the Environmental Administrative Court (*Tribunal Ambiental Administrativo* - TAA) on April of 2009 to investigate complaints against Hotel RIU, for the charges of tree felling, destruction of forest, and encroachment of the Maritime Terrestrial Zone (ZMT). The TAA is an independent tribunal in the Ministry of Environment (MINAET).³⁴

It is important to highlight at this point the importance of the Environmental Administrative Court (TAA), an independent body that sits in the Ministry of Environment (MINAET) and is in charge of overseeing compliance with environmental legislation. In fact, one of the themes that emerged from the interviews is the effort being done by this institution.³⁵ According to the Urban Planner, the current head of the TAA, Jose Lino Chavez, is a “silent environmental hero” of Costa Rica (Urban Planner, personal communication, April 2011). The administrative court was created in 1995 by the Environmental Law (Nº 7554) and began operations in 1997. After receiving a complaint (anyone can bring a complaint to the TAA), the TAA investigates the validity of the issue. The institution is composed of three permanent judges, nominated every six years by the National Environmental Council (*Consejo Nacional Ambiental*), which is itself composed of the President and the heads of the main ministries. Currently the TAA has 22 staff members and processed 2,731 violations around the country

³⁴ Article 111 of the Environmental Law states that the TAA can take the necessary actions with respect to activities that violate the legislation regarding environment and natural resources, and that article 11 of the Biodiversity Law states the “In dubio, Pro Natura” principle, meaning that when there is reason to believe that an action poses imminent or grave danger to biodiversity, the lack of scientific certitude is no reason for lack of protection.

³⁵ The TAA is one of the only environmental administrative courts in Latin America, with a vision of “promoting the equilibrium between socio-economic development, the sustainable use of natural resources, and conservation of the environment.” For more information, see the TAA’s webpage: <http://www.tribunalambiental.org/>

from 2000-2009, most of them for cutting of forests or damage to water resources. In this same period, the TAA pronounced 11,406 resolutions, the majority of which were settled by requiring a technical report from the particular sector agency involved. The court also pronounced sentences and declarations of preventive measures.

It is important to note also that the TAA has a strong presence in the field. As a result of the increase in coastal development and the concern of the TAA with the amount of infractions seen in the field but that had no formal complaints against them, they have implemented what is called “environmental field visits/audits” (*barridas ambientales*) to check whether projects are complying with environmental regulations, or with the commitments acquired through SETENA. In an interview to the online newspaper *Costa Rica Hoy*, Mr. Chavez notes that the TAA has stopped several projects already, including a project that cut a large section of forest in Jacó and was sentenced on April 27 2010 (*Costa Rica Hoy*, February 14, 2011).

c) Appeal to Costa Rica’s Constitutional Court

An individual made an appeal to Costa Rica’s Constitutional Court (*Recurso de Amparo, Sala Constitucional*) in July 2009 against the representatives of Hotel RIU for beginning construction without the necessary permits from the Ministry of Housing and Urbanism (INVU), the municipality, the Water Department at the Ministry of Environment (MINAET), and SETENA, as well as for causing grave damage to the environment.

Response from the TAA

Via a memo dated November 6, 2009, the TAA ordered that Hotel RIU halt operations as a preventive measure and gave the hotel’s manager fifteen days to submit a mitigation plan. It

then embarked on an investigation to see if it should take the hotel to court. The TAA asked all the respective agencies to contribute to TAA's investigation of the hotel by providing the necessary information. It requested Carrillo Municipality to provide details regarding the property registration, the Water Department of the MINAET to conduct an assessment of water bodies in the area (since inspection of the area by the TAA found a stream without flow), and the National Geographic Institute (IGN) for a field inspection and report regarding the demarcation of the ZMT. The TAA also asked the Tempisque Conservation Area for certification of the amount of trees RIU was allowed to cut and asked SETENA to clarify whether the hotel had environmental viability, the scope, as well as any audits they might have. The TAA also asked the National Service for Groundwater, Irrigation, and Drainage (SENARA – *Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento*) for the hydrological study on the Sardinal Aqueduct. The TAA gave everyone ten days to respond to these demands, and put the head of the Tempisque Conservation Area's Regional Office in charge of letting everyone know about these decisions.

Complaints but No Final Response or Action

In a response to the Appeal dated July 23, 2009, SETENA asked for the appeal against them to be annulled. The response was biased in favor of the developer; the institution seemed more like the developer's defendant than the institution in charge for environmental compliance. For example, SETENA noted that the developer complied with the process for Environmental Viability, at least with what corresponds to that institution.³⁶ It referred all other

³⁶ As will be discussed in more detail in Chapter 4, this shows that the process is seen as one more requirement, and not a chance to push for more sustainable practices.

issues to the respective line agencies (e.g. Water Department for water permits). The complaint noted doubts about water availability, but SETENA responded by saying that they do not find this to be an issue, first because the Water Agency emitted a permit for groundwater, and also because they required the developer to present an analysis of the well capacity and the project's water demand (which apparently they submitted on October 30, 2007, although it does not seem to be in the public folder). According to this analysis, demand is 560 cubic meters per day. Water flow is estimated at 1152 cubic meters per day, through three wells. For the agency, "This flow considerably exceeds the project's demands." Is exceeding the capacity of a well by three times considerable?

SETENA answered complaints one by one. The first issue was about water availability, as explained above. Second, regarding allegations that the commitment of constructing a desalination plant had not been completed by the developer, SETENA answered that the D1 and PGA for the desalination plant had been submitted in March 2009.³⁷ Third, regarding the allegation that the area had forest that was cut, SETENA answered that the D1 notes that there was a need to cut some isolated trees, but not in any forested areas. If the developer wanted to get rid of more trees, it would need permit from MINAET. Fourth, regarding the allegation that there are mangrove areas next to the hotel that have not been demarcated for protection, SETENA responded that it is not the agency in charge of demarcation of these areas, which should be done by the National System of Conservation Areas (SINAC, MINAET). Fifth, for the allegation that despite opposition from the department of environmental management of the

³⁷ The method proposed is inverse osmosis, and capacity of 13.89 L/s, 4 percent more than the approximate demand (13.33 L/s). SETENA has asked for more information and is apparently waiting to receive it.

National Water and Sewers Agency (AyA), MINAET gave concession to the developer, SETENA noted that this complaint should be done directly with the agency in charge of the water concession (Department of Water, MINAET) (the developer did submit two D1 forms to obtain environmental viability of three wells). Sixth, regarding the complaint that the Carrillo community was not consulted on the concession, SETENA replied that this should be contested directly with the Water Department of MINAET (notice the lack of opportunity for the community to participate in the process).

Weak Monitoring from SETENA³⁸

Regardless of the complaints, SETENA has the responsibility of monitoring project compliance with environmental commitments and regulations. Despite the efforts that the agency has been making, there is evidence of lack of capacity to adequately monitor projects. As part of the project's environmental commitments (determined when the environmental viability was granted), the developer was responsible for submitting reports to SETENA every two months on average in 2008, and SETENA would in turn write a project monitoring memo that would go into the project's public file. It was also necessary to comply with these in order to renew the environmental guarantee. The environmental guarantee is a deposit that projects have to make (1% of the investment?) to cover recovery measures in case of environmental damage. If there is no damage, the funds are returned at project's completion.

The report filed after a field visit on December 2008 by SETENA does not mention that a worker had died several weeks earlier for suspected overcrowding and unsanitary conditions in

³⁸ Large part of this information comes from the technical report, dated 16 December 2008, in the project file. This was a result of a visit conducted by SETENA on November of 2008, as part of environmental monitoring.

the workers' area of the project.³⁹ In fact, the report states that it does not mention the conditions of the waste water management and solid waste management in this area "because this was not verified in the field." There is no evidence of a legal investigation of this death. The Ministry of Health closed the construction for some days, and then after inspection on December 2 approved the sanitary conditions and allowed the construction to proceed, asking the developer to respect the capacity previously established (for the workers' area), at a maximum of 353 workers (*La Nación*, March 16, 2009). Hotel RIU apologized for the incident and said that the project had committed a "sin" on the migratory issue. They were housing three times the amount of workers, many of whom were coming from Nicaragua, permitted in the workers' area. There is no evidence of a legal investigation on this death, and there are contradictions because there is no definitive report on the exact cause of the death. RIU told the press that "It is all resolved...in RIU, there is a before and after" (*La Nación*, March 16, 2009).

It is important to note that SETENA submitted a report on RIU on October 2008. Why was this overcrowding problem not found then? Annex 3 of the D1 (Additional Technical Studies) says that the estimated volume of workers needed for construction is 1,000. This is contradictory because the project documents say that the workers' area can house approximately 300 workers, and the statements from the Ministry of Health granting approval

³⁹ The newspaper *La Nación* made an inspection at the beginning of 2009 as a result of the complaints received regarding the bad conditions for workers during construction of the hotel. The worker who died presented symptoms included vomiting and diarrhea. At the time of the incident apparently there were 900 workers, and 200 of them presented the same symptoms, although there were no additional deaths. The construction project had to be closed for several days until the developer could ensure that the sanitary conditions were in place. The autopsy of the worker showed hemorrhage as the cause of the disease, and it could not be discarded it being caused by an infection (but there are also no definitive answers). According to the newspaper *El Financiero*, there is evidence that the death is due to breach in health standards by the firm subcontracted for the construction (*La Nación*, March 16, 2009).

for the developer to resume operations with 353 workers after the incidents. It could be argued that the rest of the workers are day laborers, but this is not likely.

Falling Short of an Environmental Impact Assessment

Hotels of more than 300 rooms should require an EIA (Glasson, 2005). The fact that Hotel RIU, a hotel of 700 rooms in a very low-density area, did not require an EIA shows that there are deficiencies within the system that SETENA uses to determine the Environmental Impact Significance (*Significancia de Impacto Ambiental*) of the project. This system determines whether the project is asked to do a Declaration of Environmental Commitments, an Environmental Management Plan (PGA), or an Environmental Impact Assessment (EIA). In the case of RIU, Matapalo Beach is not registered as a “fragile area,” although the maps from the Ministry of Environment (MINAET) do show mangroves in the area. The beach also has a reef and is a place where turtles come to lay their eggs. If the project had been categorized as being in a fragile area, it would have a multiplication factor of 2, instead of the 1.5 used for areas without land use plans. This change would have meant a total of 932, very close to the 1,000 threshold requiring an EIA.

The issues discussed in the documents submitted to SETENA (D1 and PGA) are relevant (Appendix 3 provides a more detailed analysis of these documents). For example, the project notes that water consumption will be met by groundwater, and that the project will construct a wastewater treatment plant. The project will provide jobs during construction and operation, and the developer will make infrastructure investments such as improving the public road and building a transmission line. These documents are touching the right issues on the surface. The

problem is that they are not digging deep into these issues to really be able to determine tradeoffs and impacts. For example, the project receives a value of 1 (least impact) for wastewater, because it will build a treatment plant. But no details are given regarding the type of treatment plant and the process used, the level of contamination in the discharged water, and the amount of energy needed to operate the plant. The project determines that because the discharge will be used to water gardens, “the use of water will be rational,” although the water use may not be rational in other areas of the project (such as pools, showers, etc.). SETENA does not seem to make recommendations or to ask many questions either.

The project is expected to generate more than one hundred new positions (the upper threshold given for employment in the D1 form). Migration is noted as zero, but this is unlikely in an area very close to the Nicaraguan border. Another section notes that the project will hire workers in significant numbers, but there is no word about where they coming from, and whether there is any training and capacity building for locals (in contrast to Marina Pez Vela). In addition to the employment generated and mentioned above, the PGA notes that the project will buy products from the region and thus contribute to the local economy. There are no specifics on which products though. It would be good to have an economic study as part of the other studies with more information to determine the value chains.

From these documents, there is not enough information to determine whether the economic benefits from the large, all-inclusive hotel are worth the impacts on the environment. I will argue in Chapter 5 that in this case, they are not worth it. There is substantial literature on this issue, as well as evidence from places like Cancun, the Dominican Republic, and even

Hawaii where, despite the tourism coastal development and the job opportunities, locals are not really better off. But other types of tourism development *are* worth it, as evidenced by places like Monteverde in Costa Rica. This is the key question, because there is a community close by RIU (Nuevo Colón) that needs jobs. A large portion of people in this area work in the tourism sector, and don't mind these large hotels so much. Whose call should it be? In an interview with a restaurant server, she said that her world has opened up because she knows so many people now from all parts of the world, and she has learned English. She told me about the courses they were allowing her to take in her previous job in Papagayo, in a large hotel owned by a national company. She is pursuing her studies at the same time because she knows that later on, when she is older she says, they may not hire her to be the server at the hotel; so she needs to prepare to be able to find another job and hopefully climb the ladder.

Not enough details are provided to be able to determine the impact of the structure, and there are definitely not enough details on how the developer planned to mitigate them. The documents seem only to have the key words, such as treatment plant. From the project file, it seems that the developer planned an agreement for solid waste collection with a company called WWP (which probably dumps the waste in the municipal landfill); the documents note that water would be extracted from wells. In the case of electricity consumption, there is a local electricity plant for the construction phase, and the documents mentioned that the hotel would later connect to the Nuevo Colon electricity substation.

Technical Studies

The Environmental Management Plan (PGA) is accompanied by two main technical annexes, both paid for by the developer and required by SETENA. The goal of these studies is to 1) determine if the area's wells have capacity to supply water to the hotel, 2) if there is a risk of saline intrusion and contamination from septic tanks, and 3) if there is a risk of soil liquefaction⁴⁰ during a seismic event. The two studies were submitted the same month and cover very similar information, so it is not clear why two studies are needed.⁴¹ Both documents conclude that there is a need for further studies to verify that the information from the samples rings true for the entire project area. There is no evidence from the memos that SETENA questioned these results, and there is no evidence of further studies in the project files.

The studies base their criteria on the Foundations Code of Costa Rica (*Código de Cimentaciones*) and the Federated Engineers and Architects Code (*Código Federado de Ingenieros y Arquitectos*), since these are the legal requirements for structures. Both studies follow a methodology of looking at past records and bibliographical information, and direct observations in the field (note that they are done in the dry season⁴²). Samples were taken to study in the laboratory. The studies are stronger on geologic and seismic data than on hydrology and water-quality data. In terms of the risk to liquefaction, knowledge of the water

⁴⁰ The first technical study notes that looking at liquefaction risk is important because of the sand deposits in the area, which can be susceptible to this risk during a seismic event in presence of saturated conditions. For a discussion of liquefaction risk, see http://www.eeri.org/cds_publications/earthquake_basics_series/LIQ1.pdf

⁴¹ Note that the author of the second study is a member of the Federated College of Geologists and a SETENA certified consultant. Since SETENA requires that consultants be certified, I wonder if this is why there were two studies.

⁴² The urban planner says that this is because they are trying to test water availability in the driest time (urban planner, personal communication, April 2011).

table level during the wet season is important, but is lacking in these studies.⁴³ The studies provide very detailed scientific and quantitative information to support their findings, including analysis of soils and their cohesiveness, and infiltration calculations.

Despite the calls for further studies, both documents conclude that the project is viable in terms of structural soundness, provided that their recommendations are followed (that the superficial foundation system type be an inverted T beam, doubly shaped, preferably placed in a fill of different material). Due to the drainage conditions in the area, it is recommended to use a treatment plant. The project followed both recommendations during construction. Nevertheless, SETENA could have pushed the project to do a smaller building given these risk profile of the area. The second study focuses a little more on hydrology than the first one but has some contradictions. It notes that the alluvial materials are of bad quality, but then says that “there is no presence of problematic soils such as expansive clays or sands with potential for liquefaction.”

Cumulative Effects

As part of the D1 documents submitted at SETENA for the environmental viability process, the project submitted the Matrix of Cumulative and Synergistic Effects. The forms are a set of predetermined questions that the developer has to answer, regarding the impact of the project to the broader area. The answers in the case of Hotel RIU are very poor. There is clearly not an adequate discussion of the cumulative effects of such a large hotel, including the fact

⁴³ For the first study, conclusions vary on the method used. With one method of soil analysis, the consultant does find liquefaction to be likely. With other methods, liquefaction is determined unlikely, for reasons including that the sands were not saturated. The samples were taken only during the dry season in the months of January and February.

that the developer has plans for another large-scale development. For example, the project notes that there are no cumulative effects on hydrological resources. This is contradictory to one of the complaints filed through the Environmental Tribunal (TAA), for elimination of a stream in the project area. The project notes that the land use proposed adapts to the capacity of the geographic space, but by looking at the photographs in Figure 3.1, it is clear that this is a large structure in a rural area where there are no basic services. The project also claims that the structure will not generate pressure on flora and fauna resources, but there are claims that the hotel eliminated a portion of the reef in Playa Matapalo. SETENA could do a much stronger analysis of these issues.

It is heartening to see that SETENA is concerned about impervious area, since one of the questions asked whether the increase in imperviousness from the project will produce a net effect or decrease of aquifer recharge. The project states that it will not, but this seems unlikely since the project will draw water from wells inside the project area. It would have been good to have the hotel take measures to decrease the impact on the area's hydrology (e.g. through rainwater harvesting, green infrastructure). The developer notes that the area around the project has the capacity to assimilate the effects of traffic, which runs contradictory to other areas of the file where it says that the impact is over 50 percent. The developer marked "not applicable" regarding the area's capacity to assimilate the new development, but this clearly misses the issue of waste and other services that are not well developed in the area, such as emergency services. The developer notes that the project will not overload the scenery, but this is probably a subjective question, since in my view this hotel is out of proportion.

Short Term vs. Long Term

The PGA concentrates on actual conditions and does not discuss long term issues. None of the studies mention climate change and sea level rise, and these are also not included in the SETENA forms.⁴⁴ Hotel RIU is the first part of a tourism complex that includes at least another hotel and apartment buildings. There is no discussion of the potential future plans in this PGA. In contrast, other developments in the Pacific Coast of Costa Rica, like Hacienda Pinilla in Santa Cruz of Guanacaste, have a master plan that goes through the SETENA process, and then each particular project (e.g. J.W. Marriott in the case of Pinilla) goes through its own SETENA process as well. Therefore, RIU appears to be doing “phasing” of the environmental viability procedures, and SETENA is not calling it out.

II. Case Study 2 – Marina Pez Vela

Marina Pez Vela is one of the largest marina projects to date in Central America. The first phase opened⁴⁵ in the Municipality of Aguirre, Province of Puntarenas, on December 2008, without much opposition (the marina is being constructed in the area where the old Quepos pier and breakwater is). This \$16 million project with capacity for 303 boats was required to submit an Environmental Impact Assessment (EIA), given its size and the potential risks, including from fuel spills and resource consumption. The EIA is well written and makes an effort to cover economic, social, and environmental issues, although the emphasis is more on the physical and engineering aspects of the marina. This project is a good example of the potential

⁴⁴ One interview noted the lack of studies on this topic, and the uncertainty for the Pacific Coast of the country because of the risk to seismic activity.

⁴⁵ Article 3 of the Law of Marinas and Tourism Moorings (*Ley de Marinas y Atracaderos Turísticos*) notes that operations must start only when all the required services are in place.

for EIAs to provide mitigation measures ex-ante to decrease the risk of high, potential negative impacts. The developer notes that the project is following the Massachusetts Best Management Practices for Marinas (Massachusetts Office of Coastal Zone Management, 2001).

The project is located in Quepos, a poor town in the Central Pacific Coast with deep historic and social problems going all the way back to the role of the banana industry (1870-1940) in Costa Rica. The marina is expected to provide jobs during construction and operation, and it plans to make improvements in the area by treating wastewater from the town that currently ends at sea, and investing in lighting and other enhancements for the public beach area, which the community says is a dangerous drug post at night. Nevertheless, the total sum allocated for these two measures, \$12,000, is not a large investment.

Quepos is a ten-minute drive from the Manuel Antonio National Park, also on the coast, and one of the most-visited parks in the country. The hills surrounding Manuel Antonio have seen a rapid increase in the development of apartment buildings, and this has sparked environmental concerns. Nevertheless, there is an important community of local hotel owners and ex-pats in Manuel Antonio that is more integrated and organized than in other coastal tourism areas in the country. The marina could have a large anchor effect in the area, but this is not adequately discussed in the cumulative effects section. Marinas have potentially very high impacts.⁴⁶ For good results, there is a need for stronger safeguards and monitoring. This is a good time to revisit these issues because more marinas are in the pipeline (La Nación, March 26, 2007).

⁴⁶ An interviewee noted that the function of a marina is basically to receive all the waste from boats and to provide them with more resources, such as potable water.

Evidence

The Environmental Impact Assessment (EIA) for Marina Pez Vela is a strong document. The assessment is thorough and covers a set of interdisciplinary issues including impacts to air, soil, water, marine biota, and the socio-economic and cultural environment. The project identifies thirty-five potential negative impacts from the construction and operation phases, and provides a mitigation measure for each (section 10 of the EIA, "Impact Evaluation and Mitigation Measures").⁴⁷ The EIA includes a section with an Environmental Management Plan (PGA) that provides specifics regarding the mitigation measures, including who will be responsible for the actions and who will pay for them (mostly the developer). The majority of the impacts are related to water and social issues. A more detailed discussion of the impacts and mitigation measures identified is summarized in Appendix 4. After reviewing the EIA, SETENA asked for one more annex on April 2004.

Despite the positive features of the EIA, there are some shortcomings. First, the economic and social sections do not provide enough details and mitigations measures. Since Quepos is a poor area and the marina is expected to bring jobs, it is assumed that the economic impact is positive. The EIA acknowledges that few locals have the necessary technical skills to meet most of the direct jobs that will be created for the maintenance and management of the marina (EIA, Marina Pez Vela, pp. 269). Therefore, the project proposed a training program to be implemented in conjunction with the National Learning Institute (INA) so that locals can benefit from direct job creation. In terms of social issues, the project notes that the marina

⁴⁷ The methodology followed to score the impacts and mitigation measures comes from SETENA's Manual of Technical Instruments to Evaluate Environmental Impact (*Manual de Instrumentos Técnicos para el Proceso de Evaluación de Impacto Ambiental*).

could exacerbate the current social problems in Quepos regarding drugs and prostitution, but the only mitigation measure provided is police monitoring, instead of thinking of a more ambitious social program. Second, there is also not enough discussion of the potential “phasing” of the project and the impact assessment, and the fact that the marina plans to build a hotel of 100 rooms, 60 apartments, and a shopping center in the project area. The project file notes that the developer first presented a master plan on July 2005, and a final phase master plan was submitted on April 2009 — after approval of the EIA and after the developer began construction of the first phase.

Third, the developer, during construction, submitted a request to the National Environmental Technical Secretariat (SETENA) to double the scope of the first phase. Not enough questions were raised by SETENA, and there were no parallel changes to the mitigation measures. Nevertheless, the changes do reveal a learning process from the developer trying to see how best to build the marina, although most changes seem to be driven by the developer and not SETENA (although there are some examples of good suggestions made as will be noted below). Fourth, the EIA is very project and short-run focused. Although the project does discuss the marina’s relationship to the Quepos area, since it is less than twenty meters distance from some houses, there is not enough discussion of the region. In fact, in a three hundred and fifty-page document, the Manuel Antonio National Park is seldom mentioned. The EIA does not mention sea level rise or climate change. Fifth, although SETENA pushes the developer in some cases to do a better job, it does not push enough and there are some gaps in monitoring. For example, SETENA mentions in the October 2009 memo that one of the reasons to approve the changes proposed in the design of the marina is to maximize the number of spaces for boats.

This seems a justification given by the developer; the environmental agency should ask what the potential impact is.

Longer Case Analysis

The Marina Pez Vela is being constructed in two phases, with three years in between. Its main target is sport fishing⁴⁸ and tourism boats. At completion, the development will have room for 303 private and commercial vessels in an area also with 15 hectares of Maritime Terrestrial Zone (ZMT). Five hectares of land will be reclaimed in the beach by draining the inner harbor area, where there will be administrative and management offices, bathrooms, a restaurant, boat and yacht storing area, maintenance warehouse, fuel warehouse area, wastewater treatment plant, parking, green areas, and a commercial center. The second phase includes adding a hotel of 100 rooms and 60 apartments. Basic services will be provided to boats, such as potable water, fuel, receipt of wastewater, repairs, electricity, and communications⁴⁹. Figure 3.2 below shows some aerial photos of the marina.

Regarding more technical specifications, the marina has two, large, mixed breakwaters, both with a riprap section in shallower areas and a steel sheet pile circular cells filled with sand (so called cofferdams) in the deeper areas. The north breakwater is 737 meters long and the south breakwater is 219 meters long. There is also a dike of 110,000 m,³ the purpose of which is

⁴⁸ The marine specialist interviewee said that the fishing industry has never been supported by the government in Costa Rica. It is not a big industry at the national level, but it is important at the local level in coastal areas. In his view, there is a much bigger return for a fisherman working with tourists (driving boats for sport fishing or whale watching), than in fishing. (marine specialist, personal communication, January 2011).

⁴⁹ The developer, who operates the project under a *sociedad anónima* (corporation), is an American who has been a Quepos resident for several years. It can be argued that in contrast to other projects where the developer is international and is not very visible, this developer seems more committed to the area.

to retain the dredged sand. Thirty-four thousand tons of steel were required for the steel cells and 70,000 m³ of sand were dredged for the filling.

Figure 3.2: Photos of Marina Pez Vela



Source: Marina Pez Vela webpage, <http://www.marinapezvela.com/>

The project was given environmental viability in June 2004. As part of the environmental commitments, the developer was asked to submit environmental reports every three months during the construction phase and every six months during the operation phase. SETENA also asked the developer to present an Environmental Management Plan (PGA) that should include indicators for each environmental measure proposed in the EIA. The developer noted in a 2007

newspaper interview that this is a large project in a small and fragile area, so that therefore he understands why there has been extensive questioning. It took approximately seven years for the project to set the first stone. He thinks that the project will be very positive for the town of Quepos (*La Prensa Libre*, July 2007).

Concession in the Maritime Terrestrial Zone

A concession for 12 hectares in the Maritime Terrestrial Zone (ZMT) was granted on by the Inter-institutional Commission on Ports and Tourism Marinas (*Comisión Inter-institucional de Muelles y Atracaderos Turísticos—CIMAT*), part of the Tourism Institute (ICT). It is interesting to see from the project files that the CIMAT replied to SETENA saying that they can approve a concession before SETENA approves the EIA, but according some of the memos from SETENA, no concessions can be given without the approval of the EIA. In addition, there is a discrepancy in the documents regarding the total area of the marina. In some places it says 12 hectares of ZMT, in others it says 15 hectares. Moreover, most interviewees noted that Quepos is considered exempt from the ZMT law because the law does not cover “cities,” although apparently the exemption rule is not official and is being contested in the courts (Koenig, J., Dieperink, C., & Miranda, M., 2008). This reveals that there is a need for more clarity on the process of approving marinas in Costa Rica. Another interviewee noted that a one of the drawbacks of the ZMT law is that it does not cover any marine area. There is a proposal in the National Assembly to include marine territory in the ZMT (marine specialist, personal communication, January 2011).

SETENA's Approval Process and Monitoring

SETENA conducted a thorough analysis and monitoring of the project in some cases, but not in others. In particular, SETENA's probing and follow-up could be improved. For example in the memo of April 2009, SETENA asks the developer to update them on any new changes "so that SETENA can approve them and update the administrative record." This reveals an understanding of the environmental impact process as an administrative procedure. In addition, most memos remind the project about the environmental guarantee and do not take the opportunity to discuss other technical issues (e.g. the April 2009 memo reminds the project to pay the environmental guarantee that expired in March 2009). It is understandable that SETENA reminds developers about the guarantee, since it is a requirement to renew it every year, but SETENA should realize that it can go much further. One of the best examples of the lack of push back from SETENA is the failure to ask the developer more questions when the changes to the first phase were submitted, as discussed below.

Modifications

The developer submitted modifications of the project, which were approved on September 2005 by SETENA. Approval was also granted on October 2006 by the Inter-institutional Commission on Ports and Tourism (CIMAT), and by the municipality at the beginning of 2007, for a bigger concession area in the Maritime Terrestrial Zone (ZMT). Some of the most important changes included doubling the number of slips for the first phase of the project,⁵⁰ increasing boat length capacity from 35 to 150 feet, adding more space for the office

⁵⁰ From the project file documents, it is not very clear if the increase in project scope is an overall increase, or whether the first phase is being increased but the overall scope of the project does not change much. The analysis

area, and increasing the size of the breakwaters (see Table 3.1 for more information on these changes). Additional project updates/changes were approved by SETENA on October 2009.

Table 3.1: Changes made to the Marina Pez Vela Project after EIA Approval

INITIAL PROPOSAL (EIA)	CHANGES (Proposed by the Developer)
<p>Number of Slips and boat size: 93 slips, for boats of up to 30 feet in length</p> <p>Total Area of Marina: 10.90 hectares</p> <p>Piers: 85</p>	<p>192 slips (<i>note: more than double</i>); boats 35 to 150 feet (<i>five-time increase</i>)</p> <p>Area of the marina increased to 13.37 hectares</p> <p>Future piers: “as demand dictates” (decrease to 44)</p>
<p>Breakwaters: North : 450 meters South: 115 meters</p> <p>Area to recover: 7 hectares Volume of dredged material: 120m³ Depth: 3,4,5m All riprap. Materials (rocks) needed to extract from rivers: 180,400m³</p>	<p>North: 737 meters (<i>note: almost double length of breakwaters</i>) South: 219 meters</p> <p>Area to recover lower now: 5.3 hectares Volume of dredged material: increase to 200 m³ Depth same: 3,4,5m Change to mixed breakwaters: riprap and cofferdam. Reduction in riprap material (rocks) to 111,000m.³ Internal dike of 425m to retain sand from dredging.</p>
<p>Energy: 0.75 Mwh at initial operation stage; 1 at final operation</p>	<p>Energy consumption went up to 2.5 Mwh at initial operation state and up to 4.5 at the end of the project</p>
<p>Water: Water for Consumption: 3 L/s in first phase (from local aqueduct) 7l/s at project completion</p> <p>Wastewater: Estimated average 60m³ daily. Propose a treatment plant with sedimentation and anaerobic reactor of discharge (RAFA system). Will comply with discharge regulations. Waters will be chlorinated before discharging to sea</p>	<p>Water for Consumption: 7l/s for first phase (from local aqueduct) 9l/s for project completion</p> <p>Wastewater: Independent systems for the first part of the Marina and the <i>Zona Americana</i>.⁵¹ Treatment plant with capacity for 100 m³ daily. Second phase will have another plant 200m³ (RAFA). In <i>Zona Americana</i>, individual systems like septic tanks to control discharges from source (250m³)</p>
<p>Fuel Storage, Distribution, and Infrastructure: Fuel storage: one fuel tank with capacity for 20,000 gallons for diesel and another of 8,000 gallons for gasoline Fuel pumps and floating piers: Pier of 90 meters and 4 pumps</p>	<p>Three diesel tanks 12,000 gallons each and one gasoline tank of 12,000</p> <p>Floating pier of 215meters and 6 gas pumps</p>
<p>Buildings: Administrative building (temporary, 250m²) Maintenance and Repair Garage Parking:</p>	<p>Administrative buildings (775 m², two floors) Special area for grounded boats. Area: 9300m². Area for dry storage of boats: 800m². Another building of 880m² for repairs: electric, paint, carpentry, etc.</p>

provided in these paragraphs assumes that the increase in the first phase does reflect a substantial increase in overall project scope.

⁵¹ The area is called the American Zone (*Zona Americana*) because it used to house the Americans working in Quepos for the United Fruit Company.

518 for users 31 for disabled	Parking down to 107, and 6 for disabled, and 6 additional for buses. (there are some contradictions; other documents in the file say there will be a total of 308 parking spots).
----------------------------------	---

Source: author’s analysis, from information in project file and EIA for Marina Pez Vela.

There are some important changes to note from Table 3.1. The breakwaters almost doubled from the specifications in the EIA, from 450 to 737 meters for the North breakwater, and from 115 to 219 for the South breakwater. The number of slips for the first phase more than doubled from 98 to 192, and the size of boats able to come to the marina increased from a maximum of 35 feet to a maximum of 150 feet. There is no discussion about the impact or increased consumption from this increase, or any signs of SETENA probing into this.

Some Examples of Weak Monitoring

There are some contradictions between the information in the impacts and mitigation measures presented in the EIA and subsequent documents, and the information in the monitoring memos emitted by SETENA. For example, a memo from February 2007 points out that SETENA approved that works be conducted at night in September 2005. The developer’s justification is that this would allow workers to avoid the worst of the sun, and it would also allow the project to take advantage of better currents. SETENA does not say anything about the conflict of this approval with respect to national norms regulating noise, and there is no discussion about the increase in energy needs that this would imply.

Examples of Good Monitoring and Environmental Audits

There is at least one monitoring memo per year in the project folder, and at least two environmental audits have been done since project construction began in 2007, to verify compliance with the norms and approved environmental measures. From the information in

these documents, it seems that SETENA has done a strong follow up on issues such as movement of soils. For example, in a memo from 2008, SETENA approves a request from the developer to place extra dredged material outside of the project area (the developer indicates the exact places where it plans to deposit it). In a monitoring memo, SETENA notes that the dredged material was not covered and the developer should present to SETENA mitigation measures to avoid the material being carried away. In a 2009 memo, SETENA approves the developer's request for permission to use dredged material to reinforce the bases of the cofferdams. A Marine Biotic Study of the area was done to back the viability of this activity.

From SETENA's memo of December 2010 (environmental audit), one learns that SETENA checked if the project complied with obligations as employer with regards to payments to Social Security (*Caja de Seguro Social*), but that it has not been complying with the environmental reports that are due every three months during the construction phase and every six months during the operation phase. SETENA also asks the developer to always clearly present request for changes with a justification and a chart of comparison of initial vs. proposed changes, and to provide a certification by a public accountant of the new financial investment entailed by the changes to the marina, as this will change the amount required by the developer for the environmental guarantee deposit.

Key Issues with Marina Pez Vela's Environmental Impact Assessment

The section on other risks makes an effort to mitigate the potential problems that the marina could encounter, but there is not enough explanation and SETENA is not asking the developer to provide more details. Marinas can pose substantial risks, such as oil spills and dumping of wastewater to the ocean. To mitigate these risks, the marina notes that there will

be traps and facilities to extract oils from boats so that they don't get released to sea. Although this is welcome, the marina probably needs to take a stronger stance, such as by imposing heavy fines in case of any spill. SETENA needs to commit to monitor the marina on these issues. There is also no discussion on how boats will be advised on the penalties for these breaches. The marina will also have special tanks to store burned oils, and apparently the marina guarantees safe disposal of these. Since there is no landfill for these residues in the area, the developer should specify how it plans to do this safe disposal.

To deal with the potential contamination of water from fluids in boats, the developer proposes facilities to safely remove these liquids from boats. This highlights that one large impact from marinas is that they receive waste from boats coming from other areas. There could be introduction of invasive species, or boats can be carrying toxic materials that are regulated differently in their country of origin. This is not discussed adequately in the EIA and subsequent documents. The developer notes that a service to extract substances from boats will be given for free so boats are incentivized to use this system. As mentioned above, this should be complemented by imposing heavy fines for boats not adhering to the norms.

The developer notes that special tanks will be used to store burned oils and guarantees safe disposal. It would be good to provide more information on where and how this safe disposal could be effected. During dredging operations, there is also a contingency plan in case of spill, and chemical, physical, and biological contaminants in the harbor area will be monitored. In case of storms or high waves, dredging will not be performed.

Regarding the employment opportunities, it is encouraging to see the marina making efforts for the local population to better prepare to be able to compete for these positions. The marina also plans to develop assistance and community cooperation programs for educational, environmental, and social projects as part of the environmental and social responsibility of the project. It is nice to see this type of commitment at least on paper. The developer notes that the project will comply with the expectations of the fishermen in the area and will support their economic activity, but no details are given on how this would be done. As part of the EIA process, a survey was conducted to gather people's opinions about the project, but there is no sign of a significant participatory process beyond this. The EIA notes that most fishermen hope to gain from the marina, although some fear that it may bring new tourism and boat operators that may compete for the jobs.

Marinas can have potentially large impacts on the coastal environment (e.g. beach erosion, changes in wave action, impact on aquatic organisms, risks from contamination, etc.); part of the problem is that there is great uncertainty on the real impact on species. Although the EIA has sections on the ecosystem and marine biota of the area, including a quick analysis of the flora and fauna in the mangrove area near the estuary and the reef system in the area of influence of the project, the analysis is weak. Part of the issue is that the Quepos area lacks adequate sewage systems, and thus the estuary and coastal area of the town are polluted to begin with. Nevertheless, for a marina that plans to receive 300 boats, restricting the analysis to this area is insufficient. One mitigation measure noted in the EIA is the planned implementation of environmental programs to promote reforestation and environmental education in the

watershed where material will be extracted. The project has allocated \$10,000 for these activities.

Other Technical Studies

A technical study was submitted to SETENA on July 2009 to present several proposals for solving the wastewater issue for the 150 households in the *Zona Americana* of Quepos. The project has allocated \$300,000 to this component. This document has two good features that show that the developer is following some good practices: the study provides options and gives financial numbers for each option (although it does not provide much detail, since it seems like a preliminary study). Nevertheless, there is no discussion of who would manage and maintain this infrastructure, as well as what plans would be put in place to increase the system's capacity if the area grows (and in another section, the EIA also notes that the treatment plant may not be able to treat the waters during intense rains, since the area has a combined sewer and runoff system). The study discards septic tanks because of the potential pollution to water resources. The two other options presented are 1) a system to collect the wastewater through sewers, and a treatment plant for the 150 units (which would have a total cost of \$797,888, plus the additional maintenance costs and energy needs incurred); and 2) individual household wastewater treatment plants, each with its own discharge management system, by infiltration or by using the discharge to irrigate gardens. This would also imply connection to a sewer system though gravity or pumping (the total cost would be \$ 862,849). The developer has not chosen the system, and mentions that it needs to involve the Ministry of Health.

The project also includes a study of the sand dredged outside the dike area, which was done to ensure navigability of the Boca Vieja Estuary. The study finds that there will be no important changes to waves that could affect the breakwaters and the calm of the internal area of the marina. SETENA approved the request but reminded the project that it will be fined for any violation of compliance with environmental laws.

Regional Scale and Cumulative Impacts

Although the files for Pez Vela show concerns for the area of Quepos, as evidenced for example by the project's plans to invest in a treatment plant for the neighborhood, there is little discussion of the marina's potential impact on the Manuel Antonio National Park in the EIA. This park, located approximately four kilometers from Quepos, is one of the most visited in the country, with 300,000 visitors per year (Honey, 2010). In addition, the hills (*Fila Costeña*) in the areas close to the Manuel Antonio have been seeing a rapid increase in tourism and real estate investments, and it would be good to analyze the impact that the marina will have on this development.

It would be helpful if EIAs for marinas had a section on demand for boat space in Costa Rica in order to determine the viability of the project. A study conducted by the Center for Responsible Travel (CREST) notes that there are only two other marinas the size of Pez Vela in Costa Rica at the moment, but twenty-one projects are in the pipeline. The study notes that "It is difficult to say if there really is sufficient demand in Costa Rica for 21 marinas or if it actually responds to real estate speculations" (Vargas, 2010, pp. 10). As highlighted at the beginning of this chapter, the amount of foreign, direct investment over the last ten years in the tourism and

real estate sector in Costa Rica has been quite large, but the financial and real estate crisis has slowed down investment for the moment.

III. Case Study 3 – Vista Perfecta Phase II Apartments

Construction of the Vista Perfecta Phase II Apartments was completed in December of 2008. Despite having signed a Declaration of Environmental Commitments (*Declaración Jurada de Compromisos Ambientales*) when the Environmental Viability was granted by the National Environmental Technical Secretariat (SETENA) on December 2007, the development took place without any supervision by the Environmental Consultant responsible for the project, and without SETENA's knowledge. In declarations to SETENA, the consultant noted that the developer never informed the environmental firm that the project had started. The development is part of the projects in the district of Carrillo that were constructed without assurance of water supply, relying on construction of the privately financed Coco-Ocotol water aqueduct (most commonly known as the Sardinal water project).

The aqueduct project has been a divisive issue that sparked street protests in Sardinal in January 2008. A complaint to the Constitutional Court was issued on 2008 by a private individual from Guanacaste claiming among other things that there were no adequate technical studies backing the aquifer's water availability. The court accepted the complaint on January 2009. According to the newspaper *La Nación*, SETENA annulled the Coco-Ocotol water project's environmental viability on March 2010 (*La Nación*, May 21, 2010).⁵² After technical studies

⁵² The article quotes SETENA saying that the agency was only notified of this pronouncement on May of 2010.

backing the aquifer's capacity were submitted, SETENA renewed the project's environmental viability on November of 2010 (*La Nación*, November 25, 2010).

This case study serves to highlight the real estate issue in coastal areas of Costa Rica. First, this is only the tip of the iceberg, since most of these small projects either (a) go through a much simpler process in SETENA (e.g. they submit the D2 form intended for projects deemed low impact), (b) don't need to go through SETENA and need only basic permits from the municipality and agencies such as the Ministry of Health, or (c) they are built with no permits. Second, SETENA cannot keep up with the amount of small projects throughout the country processing permits, especially with regards to supervision. Third, the Sardinal controversy is not so black and white. Although this is a dry area and certainly there need to be adequate studies to ensure adequate supply in the short and long term, it is also important to keep in mind that not much public investment has accompanied the private development in the coastal regions. If these areas want to pursue tourism and real estate development as a strategy for economic growth and foreign direct investment, they will need to pursue some public-private partnerships.

Interviewees collectively expressed a concern with the cumulative effects seen in the pre-crisis real estate investment boom in coastal areas. According to the land use specialist the small projects are the real problem and may be doing more harm to the environment than the big ones, when cumulative impacts are considered (land use specialist, personal communication, January 2011). The university environmental specialist noted that he is very concerned about problems with development in coastal hills, particularly with small roads and

construction in slopes (university environmental specialist, personal communication, January 2011). The concern from the socio-economic side, according to the real estate specialist, is that these projects do not create much employment; they compete with hotels for tourists; and they are not paying much in taxes (real estate specialist, personal communication, January 2011).

Evidence

No environmental monitoring reports were submitted during the year it took to complete the Vista Perfect Phase II project, and the file does not show any submission of a final report. The reason given by the developer and the environmental consultant for the noncompliance with the environmental commitments of the project is that there was a miscommunication between them.⁵³ SETENA conducted a field visit to verify completion of construction and determined to deny devolution of the environmental guarantee, and to require the environmental consultant to come to SETENA for questioning. The issue was resolved by temporarily suspending the consultant's license. Despite taking the environmental guarantee, it is not so clear that there was any tough stance on the developer.

Regarding the environmental viability process with SETENA, the documents submitted for the project have several good things that are worth highlighting. First, the project does a good job in clearly presenting the environmental commitments, making for easy comparison between the predicted impacts and the proposed mitigation measures provided in the

⁵³ The environmental consultant apparently left several messages but could never reach the developer, who lives abroad and seems to have not finalized the contract with them or to alert them of the works. Since construction went for more than a year, it seems very careless of both the developer and the environmental consultant to have had such a long period of miscommunication.

Annexes. When the project submitted a proposal to make changes to the project, a clear comparison was done using this format, including an analysis of the percentage change in resource consumption from the increase in project scope (although the document is not clear on how these percentages were determined). Second, the project presents mitigation measures for most impacts and is creative in its measures, including green designs and other features. There is evidence to suggest that this report presents a much stronger analysis than other larger projects do (e.g. Hotel RIU).

Nevertheless, there are some limitations with this project. Although some of the mitigation measures provided are steps in the right direction (e.g. separating trash from recyclables), they do not solve the core issue (e.g. they will end up in the same municipal landfill). In addition, the project analysis is project level and fails to take into account the broader regional context, or any longer term issues. One example discussed in the sections below is the fact that the project notes that water comes from the aqueduct, and therefore states that there is no effect on groundwater or surface waters. This is true at the project level, but the impact on water resources at the regional or watershed level can be substantial, especially when real estate projects are taken as a whole. Furthermore, SETENA gives the environmental viability without adequate discussion of the project's reliance on water availability from the Sardinal aqueduct, which was still under construction at the time. Third, as most other projects going through the SETENA process, the analysis is interdisciplinary on the surface (e.g. employment and social issues are noted), but not in practice. In reality, the discussion centers on geologic and hydrologic analysis to determine mainly the seismic and

flood risk, while other issues regarding the ecosystem – runoff, water availability, and particularly social and economic issues – are not adequately discussed.

Longer Case Analysis

The Vista Perfecta Phase II Apartments project consists of 18 apartments, of 3 floors and an average area of 54m² each,⁵⁴ and a total construction area of 2,259.94m². The development is located 2.3 kilometers from the coastal zone of Playas del Coco, in an area that has been experiencing significant development (of the suburban kind), particularly over the last five years (Figure 3.3). There are similar projects in the vicinity. The project also includes green areas, streets, sidewalks, stairs, a security post, parking, and social and recreational areas including a pool. The area is relatively flat, with a hill toward the back of the property. The developer notes that there are only dispersed trees in the property, as this was previously used for cattle ranching and agriculture.⁵⁵ The budget shown for the project notes a total cost of \$927,800, \$90,400 of which (approximately 10% of the development costs) were to purchase the plot of 2,260m². By far the biggest expense was the infrastructure costs of the apartment buildings, at \$710,000 (76.5%). The project file includes a letter from Coco Water S.A. (Inc.) acknowledging receipt of \$6,800 from the project, which represents 50% of the amount that the developer committed to contribute for connection to the Sardinal aqueduct.

⁵⁴ Note inconsistency in several memos from SETENA, in which it mistakenly refers to the apartments being two floors.

⁵⁵ The developer is a corporation, the owner of which is American. The environmental consultant firm is from Costa Rica.

Figure 3.3: Photos of Playas del Coco and Location of Vista Perfecta Phase II Apartments



Source: Google Earth. On the top left, aerial view of Playas del Coco. On the right, aerial view of Vista Perfecta Phase II Apartments (author's approximation based on specifications in the project file). On the bottom, aerial view of suburban-type development in Playas del Coco.

The project submitted the D1 form to SETENA on August 2007 to begin the Environmental Viability process. Based on this information, the value for the Environmental Impact Significance (SIG – *Significado de Impacto Ambiental*) was initially 135. This value gets multiplied by 1.5 if there is no land use plan (the case in Carrillo), for a total of 202.5. The project obtained approval by SETENA on December 2007, and the project was required to sign a Declaration of Environmental Commitments and to deposit \$9,278 for the Environmental

Guarantee. The project was asked to submit monitoring reports every two months during construction, as well as a consolidated report at the end of the construction phase. Since this project is not in the Maritime Terrestrial Zone (ZMT) and there is no land use plan for the area, regulations require it to comply with municipal and Ministry of Housing and Urbanism (INVU) guidelines.

A modification of the project was submitted in January of 2010 for the construction of an additional apartment of 96m². Other additions include a pool, and a common area of 75m². The developer notes that the purpose of these changes is to get more financial return from the project. A chart comparing the old environmental impacts with the new ones was submitted, including an updated version of the environmental management plan. It should be noted that the changes are presented in a clear format that allows the reader to compare the new impacts with the old ones. For example, although the developer claims that no new impacts were detected, the developer does specify that consumption of water, energy, waste, and density of construction would increase, and provides percentages for these increases.

SETENA Monitoring Shows Both Strengths and Weaknesses

SETENA learned about the breach in the Declaration of Environmental Commitments when the developer asked that the Environmental Guarantee deposit of \$9,278 be returned. SETENA's Department of Audits and Environmental Monitoring reacted by conducting a field visit. The auditors submitted a Technical Report on July 22, 2009 that confirmed completion of construction, and recommended 1) not returning the deposit to the developer, given the noncompliance with the commitments acquired (the project's original environmental viability

expired on December 2008) and 2) requiring the developer to submit a compensation plan in accordance with article 99 of the Environmental Law.⁵⁶ SETENA also started a formal complaint against the environmental consultancy firm.

SETENA met with the environmental consultant and the issue was resolved as a miscommunication problem that had the good fortune of not having resulted in any serious impacts (environmental or others). Nevertheless, SETENA imposed restrictions on the consultant, including temporarily taking away his license to conduct environmental studies and asking him to make a presentation on the environmental impacts from tourism development at a public school. In my view, there is equal or even greater responsibility on the part of the developer, but there is no evidence of SETENA's questioning the developer or imposing any restrictions besides taking away the environmental guarantee. This could set a bad precedent. The Secretariat needs to take a tougher stance on developers. For example, SETENA could have asked for the final report as a prerequisite for approval of the additions to the project requested by the developer on January of 2010.

Cumulative Effects and Scale

The documents submitted to SETENA for environmental viability of Vista Perfecta Phase II do not adequately consider either cumulative effects or larger-scale impacts. The first example of this omission is evident from the discussion of water consumption. The documents note that the project's water comes from the local aqueduct, and consumption of surface water and groundwater is noted as zero (which is like saying that milk comes from the carton).

⁵⁶ Note that this is one of the penalties that can be imposed according to article 99, but there are others. For example, SETENA could ask for changes in construction.

Although this is in part a flaw in SETENA's project-focus methodology, the developer should have noted that this project is part of a group of real estate investments that have contributed financially to the Coco-Ocotal water aqueduct (discussed in the next section), which is intended to draw water from the Sardinal aquifer. It is important to discuss this issue in order to provide a mitigation measure, and also because communities in the region are worried that many of these projects are being approved before the water infrastructure is in place.⁵⁷ The project only mentions that it has signed an agreement with the company Coco Water and has made payments as part of its contribution to the infrastructure project. No questions were asked by SETENA. This is also true for the discussion of energy consumption. The project notes that energy will be provided by Coopeguanacaste R.L., but there is no discussion of what the cumulative impact of this increase in consumption is.

The lack of discussion regarding cumulative effects is also evident for other resources and impacts, such as waste, land use, wastewater, and runoff. The project believes that waste can be assimilated by the system currently in operation in the area, without noting that Carrillo has an open landfill that is smaller than the current demand calls for. According to a municipal official, waste is one of the top issues in Carrillo. At present, trash is taken from Panama Beach in Carrillo, 100 kilometers away (a three-hour car ride) to the Santa Cruz landfill. Another problem, according to the official, is the amount of recyclables (e.g. bottles of water, paper, and cardboard) that end up in landfills. He noted that in 2010 alone, Carrillo produced 11,500 tons of recyclables, of which 300 tons were picked and assembled by the Carrillo Self-Managed

⁵⁷ An interesting video was made by CAVU media entitled "Sardinal Water Problem."
(<http://www.youtube.com/watch?v=wZLpFNsW54A>)

Women Cooperative of Recycling Collection (COOPEMUREC – *Cooperativa Autogestionaria de Mujeres Recolectoras de Carrillo*). This is a group of close to ten women who work by separating and organizing recyclables so that private trucks can collect and transport them to a recycling facility in San José, the capital city. Some people and businesses bring the recyclables directly to COOPEMUREC, but these women also do the hard work of going through the trash to pick out what has not been separated. They work in a building that is property of the municipality, as shown in Figure 3.4. They are thankful for their jobs, but note that it is tough without any equipment. They do everything by hand, stacking cardboards into piles for transportation on trucks and taking phonebooks apart to make piles of paper (COOPEMUREC and municipal official, personal communication, January 2011).

Figure 3.4: COOPEMUREC R.L. Cooperativa Autogestionaria de Mujeres Recolectoras, Carrillo



Source: author's pictures, taken in January 2011.

In terms of land use, the project mentions that there is no modification in the land use, and that the project adapts well with the carrying capacity of the geographic space. The municipal official noted the opposite and handed me a copy of a report entitled “Temporary Land Use Guidelines,” which was written for the municipality by a team of consultants and is intended to direct development in the interim while the official land use plan is finalized and

the corresponding regulations are approved. The report notes that the municipality has been experiencing a “process of growth and transformation of land use, stimulated by the tourism and commercial activity of the region that surpasses the capacity of the municipality to provide basic services and infrastructure investment (Brenes, 2010, pp. 2).” The report also calls for a watershed approach to planning in the area and a moratorium of all permits for new development until the official land use plan is in place.⁵⁸

Another cumulative issue of real estate projects that is not being questioned sufficiently is wastewater treatment plants. What is the impact of having many real estate projects, each with its own small treatment plant? Are there other better solutions, such as having projects contribute to a local infrastructure and maintenance fund? It is also interesting to note that treatment plants get the least penalty in the environmental significance matrix, with a value of 1. However, the documents for Vista Perfecta offer no details regarding the kind of treatment plant to be used or the expected discharge levels. As the agency in charge of monitoring compliance with environmental commitments, SETENA should have a more complete picture of these impacts.

The project notes that it will not represent an increase in the environmental load for the system of ordinary residual waters. As a cumulative effect though, the increase in impervious surface in the area is changing the hydrologic system. It is encouraging to see in SETENA’s forms the question of whether the impervious cover implied by the development will produce a net decrease in the recharge capacity of the aquifer. In this case, the direct answer is “No,”

⁵⁸ Another issue to note here is the “Chorotega Decree,” passed by the President and some ministers, to regulate land use in the interim while land use plans are being developed and approved in Guanacaste. The issue has been divisive; there are mixed feelings about its usefulness among the interviewees.

because the project's direct consumption is being met by the public aqueduct. Nevertheless, the true source of this water is the Sardinal Aquifer. The analysis of imperviousness surface should be extended to capture a broader scale, as well as issues of runoff.

The university environmental specialist said in his interview that in his opinion, the real estate problem is severe. Developers have opened up roads in hilly areas and much of the urbanization is being done without any regulation or permits (university environmental specialist, personal communication, January 2011). The environmental consultant gave the examples of the "ocean view" development in the hills (Fila Costeña) of Quepos, where there are more than forty environmental lawsuits that include projects that have permits. This shows the deficiencies of not having a land use plan. He was also skeptical of real estate investment as an economic strategy, since it has a smaller effect on employment compared to hotels. The consultant also notes that the hotel owner, especially in medium and small hotels, is more likely to stay in the area, while for the real estate projects the owner is not necessarily living in the area (environmental consultant, personal communication, January 2011).

The Coco-Ocotal Aqueduct Affair

The Vista Perfecta project contributed to the investment on the Coco-Ocotal water aqueduct to bring water from the Sardinal aquifer. This project was an initiative by twenty-five business owners in the tourism and real estate business who partnered to create a trust fund to allow them to build an aqueduct to bring water to their coastal projects. Although the project involved the National Water and Sewers Agency (AyA), the lack of public involvement since the beginning of the project sparked distrust, and the community protested. Besides participation,

the other shortcoming in this process was the lack of scientific data regarding the aquifer's capacity. A more transparent and inclusive process could have avoided many of the problems encountered. Guanacaste is the driest area in the country, and it is likely that conflicts over water will only keep growing.

The National Water and Sewers Agency (AyA) submitted the Coco-Ocotal aqueduct project to SETENA requesting environmental viability. The project was deemed "very low impact," mainly because it was placing the pipes in an area of public road, and the project was considered in the public interest.⁵⁹ SETENA gave the project environmental viability on December 2006, but the AyA did not sign the Declaration of Environmental Commitments until 2008. One of the conflicts that emerged was whether the AyA had the right to pursue this project if the funding was private and the ultimate beneficiaries were private investors. The discussion involved several institutions, including the General Attorney of the Republic (*Procuraduría General de la República — PGR*), the Ombudsman Office (*Defensoría de los Habitantes*) and laws such as the Urban Planning Law (*Ley de Planificación Urbana*). The PGR produced several memos and noted that AyA has the last word on the technical studies to determine if the volume of water is adequate. The PGR also noted that AyA can join in a private investment only when it is in the "public interest," and that once constructed, the infrastructure needs to be passed to the public sector.⁶⁰ The issue was very divisive and controversial. The municipality signed the permit for the project and gave permission to

⁵⁹ The Sardinal project scored 85 in the environmental significance with SETENA. The analysis of environmental impact is not thorough. For example, the section on water impact has a value of zero. The issues considered are waste and traffic.

⁶⁰ Although this has its advantages, there could be problems in maintenance if not planned adequately in the budget.

rupture the public roads to install the pipes. The Waters and Sewers Agency (AyA), the Ministry of Environment (MINAET), and the National Service for Groundwater, Irrigation, and Drainage (SENARA—*Servicio Nacional de Aguas Subterráneas, Riego y Avenamiento*) were all in favor of the project and published a study entitled “Technical Report for the Management of Water in the Sardinal Aquifer” on October 2008. The University of Costa Rica published a more skeptical study entitled “Implications of the Coco-Ocotol Project”(University of Costa Rica, 2009). The municipal official said that although agencies like SENARA consider that there is enough capacity, he thinks there could be a problem in the medium term if the water is not adequately managed. In fact, he is a supporter of having initiatives such as green gardens to capture water (municipal official, personal communication, January 2011).

Personally I think that SETENA should probe deeper into these issues. The analysis conducted for the environmental viability is very poor and vague. In fact, one common theme in the protests from residents of Sardinal is that these projects should be required to conduct a full-blown Environmental Impact Assessment. This is probably a step in the right direction. At the same time, it is important to keep in mind that the public sector is lagging behind in the infrastructure needs that could be accompanying these developments, such as roads, sewer lines, recycling facilities, and landfills. The challenge and more interesting question then becomes: How can these developing areas better work together with the private sector to generate solutions to these problems? How can local entrepreneurs also take advantage of new niches to start new businesses? It is important to develop the capacity of local institutions to engage in public-private partnerships, and the technical studies to be able to make the right

decisions in terms of long-term availability of water resources for local communities. It will be very hard to do this without a process that includes local communities.

Issues with the Impact Valuation in the D1 Form

One positive feature of the D1 for Vista Perfecta is the use of green design initiatives as mitigation measures for impacts such as water consumption. Nevertheless, not enough details are provided to determine if these measures will be effective. For example, the developer notes that rainwater collection will help reduce water consumption from the public aqueduct by 30 percent. Since the Guanacaste region has a very marked dry season, one potential issue is whether the tanks have enough storage capacity to capture the water necessary to water the gardens during all the seasons, although the measures do note that only native species (which would adapt to the dry climate) will be used. The project also plans to mitigate the impact on water consumption by using the discharge from the wastewater treatment plant to water gardens, but no details are given regarding how this will work in the rainy season or what the final discharge levels will be.

Monitoring implementation of these kinds of mitigation measures can provide lessons regarding the type of incentives needed to get developers to adopt green design practices.⁶¹ It is good to see that the SETENA form asks projects to think about imperviousness. Nevertheless, the discussion is more about the effects on water aquifers, and less about runoff. In addition, SETENA is not asking developers to go further in their designs, with measures such as pervious

⁶¹ One interviewee mentioned that there are perverse incentives for groundwater that make water cheaper the bigger the quantity extracted. He thinks that this comes from large industries that benefit from these measures.

parking and retention ponds. As noted by the urban planner there is a lot of potential to find solutions through the project designs (urban planner, personal communication, January 2011).

The analysis submitted by Vista Perfecta to SETENA is also more open about the project's potential environmental impacts than other projects are. For example, the project notes that it will produce cumulative effects on hydrological resources and provides mitigation measures like the ones discussed above. In contrast Hotel RIU, a much larger project, says that there is no increase in net flow and provides no mitigation measures. Economic and social impacts are not well discussed in either project though. The value given for migration in Vista Perfecta is zero (meaning, migration is projected to be below 1 percent of the existing population in the area of influence of the project). This is contradictory because if projects are really creating jobs and there is growth potential, it is unlikely that there is no migration, especially temporary migration during the construction phase. To make sure that projects are complying with worker's laws and rights, there needs to be more clarity on this issue. SETENA's assessment of employment could be strengthened by further subdividing the thresholds for employment in the scoring sheet to get more details. How many jobs would be local? How many would be indirect jobs? SETENA's mandate includes the balancing of environmental, social, and economic concerns, and yet the economic and social parts of these assessments are very superficial.

The lack of push back from SETENA is clear in the sections on risks, solid waste, landscape, and soils. First, the technical studies include a map that shows a fault that runs right through the property, but there is no discussion of this beyond noting that the project should

comply with the country's building codes. The potential flood hazard from the San Francisco stream is discussed, but only in a descriptive manner; no quantitative measure is given. It would be best to look at past records in Guanacaste, and there should be a standard way of doing this for all the projects. Note that agrochemical is valued at zero, although the project would be using fertilizers for the green areas. Second, the project's discussion of solid waste reveals a shortcoming in the thresholds and classification of options in the SETENA forms. The project, for example, gets a value of 3 (out of 5) for ordinary waste, as it plans to classify to recover, reutilize, and recycle waste, and the final disposal is a landfill. When the project presents an increase in scope, waste is expected to increase by 15 percent. The mitigation measure proposed is separating the additional waste. However, there is no discussion on whether the landfill has the capacity to manage this increase in waste load, and the project makes the assumption that it does. The project gets the same value for special residue, and the developer notes that it will follow the same procedures; the only difference is that the final disposal is a specialized landfill. There is no discussion of where this specialized landfill is though, and whether it really exists (I doubt it). The issue of solid waste is discussed in more detail in the cumulative effects section.

Third, the project receives a value of 3 out of 5 for the landscape category, meaning that the project does not cause disequilibrium in the existing countryside. The argument is very subjective. Many of these coastal communities are undergoing a transformation, and in places like Tamarindo, Guanacaste, locals have been moving further and further from the coast to give

room to new projects.⁶² Fourth, there is a contradiction regarding movement of soils, with certain sections of the project file noting that they had already been done when the project started processing the environmental viability with SETENA, and other sections presenting mitigation measures (such as covering the soils with polythene canvas) for the movements of soil as if they were happening in the future. Regarding slope, it is interesting to see that in SETENA's forms the maximum value penalty is 4 for slopes greater than 60 degrees. This seems too high a threshold because usually slopes greater than 45 degrees are problematic to develop. This is an issue particularly pertinent to real estate developments in coastal areas where views are highly valued. SETENA should consider lowering the threshold of 60 degrees and increasing the value to 5 (greater score/penalty).

Issues with the Technical Studies

Two technical studies were submitted to SETENA as part of the environmental viability process. Both are very technical, and their main purpose is to make recommendations on the foundations and supporting capacity of the structures needed to comply with seismic codes. The first study, called "Basic Engineering Study," was done by a consultant firm and is dated February, 6, 2007. The methodology consisted of field visits, analysis of soils samples, and the use of past studies to describe the hydrologic impact of the project. The second study is a geotechnical analysis that builds off from the first study (it uses its soils sample results) and discusses soil mechanics, permeability of soils, and risk of liquefaction. It was conducted by a

⁶² The lack of regular buses to transport people from their houses to the coastal projects has been problematic for these communities. A worker in a coffee shop in Tamarindo told me that for her, a regular bus system is a priority.

consultant, and submitted on July 2007.⁶³ The study performs a more thorough analysis of the hydrology of the area, including describing the embankment for the San Francisco stream that is close to the property; it fails, however, to acknowledge or correct for the limitation of not having data from the rainy season. The consultant points out that there are some houses close to the river banks and notes that there is no evidence of a flooding event from the San Francisco stream; however, she does not provide any account from locals of whether they have experienced flooding in this area. The consultant ends by recommending expanding the scope of the study.⁶⁴

⁶³ It is interesting to note that these studies are submitted with a signed letter of professional responsibility in which consultants also have to show that their accreditation/credentials with SETENA are up to date.

⁶⁴ I have noticed that many technical studies recommend expanding the scope of the study to make sure that their conclusions (drawn from samples) apply to the broader area of the project. This might be to prevent the risk of a lawsuit.

Chapter 4: Cross-Case Analysis

The three case studies presented in Chapter 3 reveal three main problems with the Environmental Assessment process in Costa Rica. First, the National Environmental Technical Secretariat (SETENA) is more concerned about projects being within the law than about sustainable development. As such, the opportunity that environmental assessments provide to take preventive measures has not been taken. Second, SETENA has a weak monitoring capacity. Problems are not being flagged during supervision, and projects are being constructed without the agency's knowledge. Third, although there are opportunities to file complaints against projects, there is no evidence that this produces better outcomes. The three cases show that the environmental viability system is not providing the right space to make tradeoffs between economic development and environmental protection in the coastal zone of Costa Rica.

SETENA Checks Mostly for Compliance with the Law

The National Environmental Technical Secretariat (SETENA) was created in 1995 by the the Environment Law (*Ley Organica Ambiental*) with the purpose of finding a balance between the environmental and socio-economic impacts of projects through the environmental assessment process. Several interviewers mentioned that more than anything, SETENA is concerned with making sure that projects comply with the law, and at the same time being as flexible as possible . The agency is also careful about not being implicated in lawsuits. However, cases like Hotel RIU are proof of serious deficiencies in the approval and monitoring of projects. There is evidence to suggest that the hotel has broken serious health norms and has damaged

the environment by cutting mangroves in the Maritime Terrestrial Zone (ZMT), eliminating a small river, and cutting part of a reef in Playa Matapalo.

In all the examples explored in this thesis, it is fair to say that there is not enough questioning from SETENA. Most studies are very technical and engineering oriented. They are concerned with geologic issues in order to comply with building codes, and with hydrologic issues especially regarding the perforation of wells (both of which are very important but should not be the only issues of concern). In addition, except for the case of the wastewater treatment plant in Marina Pez Vela, and the green design measures provided by Vista Perfecta Phase II, the environmental documents of the projects have almost no discussion of design alternatives (including no-build), and SETENA does not push for these. For the marina, the environmental assessment was more thorough, in part due to the large impact marinas can have and the fact that the project required a full-blown EIA; however, there was still not enough push back to consider alternatives, and the developer might have gotten away with some phasing. The developer submitted what was basically a proposed doubling of the size of the marina and the ship capacity, and there were not many questions asked.

In addition, the studies have very little discussion of broader environmental, economic, and social concerns. For example, none of the three cases analyzed costs and benefits to the area of influence of the project or hinted at the short and long-term costs and benefits to the municipalities where they are be located. There was no discussion of the effects that the new real estate projects would have on municipal landfill capacity or operating costs, on the potential tax base increases associated with these projects, or the spill-over effects, such as

increased growth from anchor projects like Marina Pez Vela. Employment creation could be further disaggregated to specify the quality of the jobs being created and the likely beneficiaries.

Environmental Assessments are also not providing enough technical information to make good decisions. For example, SETENA approved the Vista Perfecta apartments and the Sardinal aqueduct without having adequate studies backing the aquifer's capacity to serve the local community and the new real estate and hotel projects, in the short and long term. The project also sparked controversy because it did not involve the community from the beginning (see a photo of a protest in Sardinal, shown in Figure 4.1). The lack of adequate studies and the lack of transparency and participation were what made the project a perfect target to stall in the courts for three years in a back-and-forth battle. The Sardinal environmental documents submitted to SETENA provide a very poor discussion, and the apartments were given viability before construction of the aqueduct was finished.

Figure 4.1: Protest in Sardinal over the Coco-Ocotal Water Pipeline



Source: Photo by Grupo Nación, in Camacho Sandoval (2009).

A credible forecast of the environmental impacts associated with a proposed real estate project ought to begin with a carefully documented baseline analysis. Note that the environmental documents discussed in this thesis make almost no reference to historical, local, and regional records regarding precipitation patterns, water quality, runoff loads, hazards, or stream erosion. In one instance the precipitation values used were from a publication that was more than fifty years old and from a couple of samples taken during preliminary field studies. Having good information is essential for good planning and decision making.

SETENA Has Weak Monitoring Capacity

The three cases reveal deficiencies in SETENA's monitoring capacity. In the case of Hotel RIU, more adequate monitoring might have flagged the lack of compliance with health standards in the workers' area. It is unacceptable that a field visit and report conducted one month after the death of a worker (allegedly caused by unsanitary and overcrowding conditions in the workers' area) notes that there is no comment on the conditions in the that area because they were not checked during the visits. This lack of capacity to monitor is also evident in smaller projects such as the Vista Perfecta Phase II Apartments, where the agency did not know the project was under construction for one year. SETENA could have asked for a final report, even if construction had already been finished. There is no evidence of a report in the project files.

Part of the problem is that SETENA is overwhelmed with the amount of responsibility. According to the urban planner, SETENA cannot do more than it is doing now with current capacity. It is an agency with a small number of staff. To strengthen SETENA as an institution,

the government needs to invest in capacity building by hiring more personnel and providing training. It could create a trust fund for this effort, and perhaps developers could contribute to it (urban planner, personal communication, April 2010).

Several interviewees mentioned concern with the cumulative impacts from small projects (e.g. construction in steep slopes, deforestation, lack of proper distance from rivers and streams), which often go unnoticed by SETENA, either because they a) go through a very soft procedure in SETENA called the D2 form for projects of small impact, b) because they are not required to go through SETENA, or c) because they are constructed without permits. Even projects approved by SETENA, when taken as a whole, may have substantial cumulative impacts. One example is all the small treatment plants that are being constructed. Although the Ministry of Health has been one of the more responsible agencies, closing down projects not complying with the law, they may not be able to check all the small treatment plants. This is not being discussed by SETENA. The land use specialist mentioned that many of the small projects pay money to municipalities and get away with illegal constructions. One of the most promising activities, specially implemented two years ago, to combat this construction is the 'Environmental field visits/audits' (*Barridas Ambientales*) program that the Environmental Administrative Tribunal (TAA) has implemented. This initiative will be discussed in Chapter 5.

Complaints Don't Produce Much Change

Although there are opportunities to file complaints against projects, there is no evidence that this results in anything being done, or in better outcomes. In the case of Hotel RIU, SETENA's reply to the complaint filed to the Constitutional Court is very biased against the

developer. SETENA refers all issues to the respective agencies, such as when it says that concerns over cutting mangroves should be directed to the National Conservation System (SINAC – *Sistema Nacional de Conservación*). Instead, SETENA should be an umbrella agency in charge of communicating directly with the relevant agencies on important issues during the environmental viability process and also through the monitoring phase. In the case of the Vista Perfecta project, although SETENA takes action by questioning the environmental consultant and withholding the developer's environmental deposit, there is no questioning of the developer, and the agency does not ask the project to submit a construction completion report.

The Environmental Administrative Tribunal (TAA) pronounced a sentence to the complaint filed against RIU that ordered stopping operations and asked explanations from several agencies. There is no evidence in the project files to believe this was done. The case seems to be open still. One issue is that TAA is supposed to delegate complaints to SETENA when the project in question has environmental viability, which RIU has. Seeing the deficiencies in SETENA, this does not seem helpful. To improve the system, it seems necessary to strengthen SETENA as the agency checking compliance from the beginning and during monitoring, and the TAA as the agency in charge of investigating complaints.

Conclusion

Of the three cases analyzed in this thesis, the case of Hotel RIU best represents failure on all fronts. It provides an example of projects that will not contribute economically to the development of the region, in proportion to its size and investment (there are several studies

on this issue; all-inclusive hotels are proved to leave little to the community). It is also an example of serious social issues, such as the contracting of a construction agency that violated working and health laws. In terms of environment, the hotel was the cause of several complaints. In my view, Playa Matapalo, if designated as a tourist area, should have been designated for a lower density. This hotel is completely out of proportion. This hotel is more appropriate for a place such as the town of Jacó, where the coastal area has been developed for years and there already is considerable density.

How can Costa Rica make sure not to have another RIU? Is the solution more and better land use planning? When discussing the issue of the wave of development in coastal areas, one of the interviewers noted that the problem is that there is no planning in the country. In other words, there is a sense that if there were adequate land use plans in place, it would be easier to conduct the environmental assessment of these projects. Although this is a very important step in the right direction, the solution needs to move beyond that. Land use planning is a vital component that is missing, but it takes time and resources, and investment sometimes comes first. How can areas such as Carrillo and Quepos strengthen the mechanisms available to stop bad developments, while land use capacity emerges? Chapter 5 will provide some recommendations.

Chapter 5: Recommendations

The goal of this chapter is to present a summary of the main challenges and opportunities in the development of coastal areas in Costa Rica, and to present recommendations to improve current practice. I am particularly interested in the way the country is trying to handle tradeoffs between economic, social, and environmental goals when they need to be made. The chapter will make recommendations along three major lines of actions. First, changes must be made in the national sustainability framework. Second, Environmental Impact Assessment regulations should be updated to correct for the current gaps. Third, more and better planning needs to happen at the national, regional, and local levels.

Coastal Development Opportunities and Challenges

The increased development of coastal areas in Costa Rica presents several opportunities. Besides increased employment, coastal municipalities have seen a recent increase in public sector investment. The Chorotega (Guanacaste) region received more public investment for airfields than any other region in the country (for Liberia Airport) during the period from 2001-2008 (MIDEPLAN, 2009). Although development has been “messy,” meaning unplanned and unregulated, as noted by the land use specialist, steps are being taken to correct this (land use specialist, personal communication, January 2011). The Cadastre Project is digitally mapping the Maritime Terrestrial Zone (ZMT) area in all of the Pacific Coast, and producing plans for all the areas that have not been planned by the Tourism Institute (ICT) or

other agencies.⁶⁵ The Cadastre Project has also hired a planning firm to develop land use plans for all of Guanacaste (not only the ZMT) (*El Financiero*, February 2011).⁶⁶ There has never been such a big push to strengthen planning in coastal areas. These plans are very important inputs for coastal municipalities, but the real test of these tools will be at the implementation level.

There are challenges to overcome. The demand for services such as potable water, wastewater systems, and waste collection and disposal is increasing at a pace faster than municipalities (or the national government) have been able to handle. Land is changing ownership, and employment in commerce and services is growing faster than employment in the agriculture and livestock sector. There have been issues with lack of compliance with regulations and lack of monitoring (i.e. major breaches in the health and sanitation of the worker area in Hotel RIU), and tools such as the environmental assessments reviewed by SETENA are being treated as procedural requirements more than opportunities for enhancing the sustainable development potential of projects.

The rapid increase in tourism and real estate investments has challenged the infrastructure capacity of coastal municipalities, particularly those with systems intended for smaller urban populations, or no systems to begin with (e.g. sewers systems, water provision, and trash collection). As part of the Wiki Leaks matter, the local paper *La Nación* published a summary of the main points in memos from U.S. Diplomats and the ambassador to their colleagues in Washington D.C. saying that “Costa Rica is not a paradise, there is wastewater

⁶⁵ For example, the Program on Sustainable Urban Development from the University of Costa Rica, ProDUS, is developing the plans for Peninsula de Osa and Isla Chira.

⁶⁶ The project has been made possible through a loan that the national government took from the Inter-American Development Bank, for a total of \$ 65 million. The government has in turn put \$27 million for the project.

everywhere.” The ambassador is quoted as saying, “Costa Rica is green, but is not completely clean.” The memos note that “roads, airports, ports, electricity generation capacity, waste treatment and wireless telecommunications suffer from negligence, limited capacity, and slow development. The lack of local, regional, or national planning and the unstoppable development, especially in tourism center of high category in the north Pacific, make the problem worse” (*La Nación*, March 19, 2011, author’s translation). The issue to which they are referring may be the temporary closure of the Hotel Allegro Papagayo by the Ministry of Health for inadequate treatment of wastewater (*La Nación*, February 4, 2008)..

Another newspaper article from *La Nación* dated 15 of March, 2011, notes the Tourism Institute (ICT) and the Ministry of Health are contesting the results from a study conducted by The World Economic Forum entitled “Travel and Tourism Competitiveness,” in which Costa Rica is downgraded from first to second place in Latin America tourism, mainly because of road and sanitation infrastructure deficiencies. The directors of ICT and Ministry of Health question the methodology of the study, since the indices of health have been improving in the country in terms of life expectancy and infant mortality (*La Nación*, March 15, 2011).⁶⁷

Recommendations

1. A ‘New’ National Sustainable Development Framework

Development patterns reflect the way that society balances competing values. The current system in place in Costa Rica is not giving society the space to reflect and contest different views on environmental, economic, and social issues in a productive manner. The

⁶⁷Nevertheless, the article notes that Professor Lawrence Pratt from INCAE Business School in Costa Rica defends the methodology, which he says penalizes the country for the deficiencies in infrastructure, although it gives it substantial credit for conservation, a major factor in people’s decision to visit the area.

focus has been on narrow regulations, rather than discussion of goals and ways to achieve them (specialist on Costa Rica, personal communication, January 2011). As was noted in the previous chapter, interviewees noted that there are many complaints regarding development in the coastal mountains of the Central Pacific Region because of the inadequate construction in high slopes. Many of these developments have permits, others don't. Despite the legal complaints, the development is continuing. There is no other way for citizens to engage in a conversation regarding these developments outside of the complaint system. And although the legal route is important and has been instrumental, particularly with the work of the Environmental Administrative Tribunal (TAA) and the Ministry of Health, the status quo for the most part is proving ineffective to solve the core issue of sustainable development.

- *Strengthen the EIA Procedure and Increase Dialogue*

The system in place to prevent impacts in the first place, through the Environmental Assessment/Environmental Impact Assessment, is not pushing projects to go beyond complying with very basic regulations. On a first level, SETENA must be strengthened with enough capacity and resources to be able to adequately analyze and monitor projects. As shown in case study analysis of Chapter 3, studies need to be interdisciplinary and to account for scale and cumulative effects more effectively.

As a tool designed to help make decisions and tradeoffs on economic, social, and environmental issues when needed, the EIA provides a good setting to break silos among disciplines and surpass ideological battles. Part of the problem is that environmentalists are still seen as “anti-development” while private developers are portrayed as resource exploiters. As

the land use specialist told me in her interviewee, “In Costa Rica, environmental issues are radicalized” (land use specialist, personal communication, January 2011). The decision-making process regarding social, economic, and environmental tradeoffs could provide good opportunities for dialogue between these two opposing factions, on a case-by-case basis in which detailed information could be used to analyze real choices that need to be made.

- *Address the Implementation Problem*

Most interviewees felt that Costa Rica is a very legalistic country, but that despite having many laws on the books, implementation is a constant problem in the country. The rules have created a labyrinth, with people just thinking how they can work their way through them (specialist on Costa Rica, personal communication, January 2011). Some of the laws, such as the Water Law from 1942, are very old and need to be updated (The urban planner noted that one of the issues with the old laws is that the fines imposed become obsolete, so people don't mind breaking the law and paying the small fine). Other laws are so extreme, complex and out of context, that it becomes difficult to create practical regulations for them; but without these regulations, there is no capacity to sanction offenders (urban planner, personal communication, January 2011).

The lack of capacity to apply the regulations makes planning difficult in practice. The university environmental specialist noted that if land use planning and regulations are going to work, it means that the municipality has to be willing to “say No” to a request for permit, or at least to be able to ask the developer to make changes to the proposal. In his view, the chances of this happening are small because “there is a tendency to adjust things, to make them fit”

(university environmental specialist, personal communication, January 2011). This is definitely evident by looking at the D1 forms of SETENA, where it is not very clear why certain values and thresholds get chosen.

SETENA needs to be able to make the leap from looking only at compliance to analyzing a project in light of the sustainable development goals of the country. As described in Chapter 2, the D1 forms on which impacts are scored and multiplied by a predetermined factor should in theory be one way in which the agency could make these judgments, but the fact is that it is very easy to manipulate the numbers in these forms in order to get a desired result without really having to make any tradeoffs. There is no other way a hotel of seven hundred rooms could have gotten away with an Environmental Management Plan instead of an Environmental Impact Assessment.

- *Protect Coastal Environments*

The university environmental specialist noted in his interviewee that the dry forest in Mesoamerica goes from Mexico to Guanacaste. It is close to the marine coastline, but in Costa Rica it is only protected in areas like Santa Rosa National Park. “There has been a major loss of the dry forest, wetlands, and mangroves in the Pacific coast of Costa Rica” (university environmental specialist, personal communication, January 2011). There is a need to value these ecosystems. (Mangroves for example provide valuable protection against storm surge.) One way to integrate this valuation into the sustainable development framework is to enforce the economic analysis that should be done as part of the EIA process. “The country is pursuing coastal development without thinking about sea-level rise. There already is loss in beach and

recession of the coast, but development is not taking this into consideration. There is also pollution in coastal areas” (marine specialist, personal communication, January 2011). The marine specialist noted that it is important to propose specific criteria to help break this pattern of development. In a visit to ProDUS at the University of Costa Rica to learn more about their work (they are doing the coastal plans for the Osa region), its director Dr. Rosendo Pujol told me they have come to the conclusion that the small business owners, hotel owners, and population in general are better off by leaving large portions of the ZMT as non-concessional areas⁶⁸.

- *Strengthen the Environmental Administrative Tribunal (TAA)*

Chapter 3 introduced the Environment Administrative Court (TAA), an independent body that sits in the Ministry of Environment (MINAET) and is in charge of overseeing compliance with environmental legislation. Besides SETENA, the TAA is the other key agency that needs to be strengthened in the New Sustainable Development Framework. The TAA processed 2,731 violations around the country and emitted 11,406 resolutions from 2000-2009. The court also gives sentences and declarations of preventive measures, and conducts what are called “environmental field visits/audits” (*Barridas Ambientales*). The purpose of these unannounced regional visits is to inspect projects for which the TAA has received a complaint, and also to check if there are other projects that are not complying with regulations (TAA, 2011).

⁶⁸ Dr. Pujol noted that in his view, the EIA process in Costa Rica needs to move to a system in which the developer pays a fee for the EIA, but it is SETENA who contracts the consultant. He mentioned that some agencies in the USA follows a system like this.

According to the TAA, the idea of the *Barridas* was conceived in 2007 when reviewing that year's work, the TAA realized that particularly in coastal areas, each staff member conducting a field visit to investigate a complaint would bring back four more cases of non-compliance that had not been filed. A total of 20 *Barridas* have been done to date, and more than 300 new files have been opened at the TAA as a result. Many are very serious, such as a development in Guanacaste of 200 apartments that had roads on slopes with cuts of 90 degrees. Other infractions include roads through mangrove areas and deforestation of national parks to open up land for development. The illustrations from these type of incidents are shown below in Figure 5.1 (TAA, May 2008).

Figure 5.1: TAA's *Barridas Ambientales* Report for the Chorotege Region Shows Infractions



Source: Environmental Administrative Tribunal. The first picture shows roads with cuts of 90 degrees on slopes with grades ranging from 60-80%. The second picture shows a road dividing a mangrove in *Parque Nacional Marino las Baulas*.

2. Update EA/EIA Regulations

Despite the shortcomings with the current EA/EIA process, coastal development (among other issues) has helped to put the EA/EIA issue on the table. There is a window of opportunity to strengthen the EIA in Costa Rica as a tool to make effective sustainable development decisions. In fact, the government held a workshop on April 1, 2011 to review a proposal to

amend the Regulations in the SETENA process. According to the urban planner, one of the most important issues being discussed is whether to change the system currently in place, where environmental consultants are certified by the National Environmental Technical Secretariat (SETENA) to be able to make EIAs and other documents for developers and to present them to SETENA. There is interest in moving to a course certification system. Although on the surface having this course seems reasonable, the urban planner expressed concern. Who says that this course is good? It ends up being a business for those giving the courses. There is an interest in keeping a closed circle (urban planner, personal communication, April 2011).

A group of professors and professionals sent a letter to the President, the head of the Ministry of the Environment, and other government leaders complaining about the lack of public participation in formulating the proposal and in the discussion provided by the private meeting (*El País*, 2011). The letter states that the EIA is a key tool for sustainable development decision making, and that it should be participatory, including at the level of making regulations. There are two main issues of contention with the proposal. One is about the Mixed Technical Advisory Commission (*Comisión Técnica Asesora Mixta*), established under Executive Decree (*Decreto Ejecutivo Número 31849-MINAE-SALUD-MOPT-MAG-MEIC*), which states in article 121 that the commission should advise SETENA and should include the Executive Branch, the private sector, NGOs, and environmental consultants. The letter notes that the commission has not met since 2007 and calls for a reactivation of the commission. The second issue is about the apparent proposal to amend the consultant certification process discussed above. The way in which this issue will be dealt with will be a determining factor on whether the argument gets

polarized and results in inaction, or whether the different actors are able to come together and revisit SETENA's regulations in a productive fashion.

In the meantime, the following changes to EIA regulations can be proposed:

- *Enforce Regulations*

The World Resource Institute notes that an important measure in coastal development is to “enforce coastal development regulations such as building setbacks, sewage treatment, run-off controls, and retention of mangroves and sea-grass” (WRI, March 7, 2011). The EIAs need to do a better job at pushing projects to comply with standards and regulations, and the Maritime Terrestrial Zone provides an opportunity to enforce setbacks. The legal specialist interview said that “the law provides a floor” (legal specialist, personal communication, January 2011). At a minimum, regulations should be enforced.

- *Strengthen SETENA's Capacity for Monitoring and Control*

As discussed in Chapter 4 and in this chapter, SETENA has not been able to effectively identify impacts ex-ante, or to push projects for mitigation measures, or to provide adequate monitoring. Because SETENA's role is so important, the government needs to strengthen the institution by investing in capacity building and training and by hiring more personnel. It could think of creating a trust fund for this effort that developers could contribute a fee to. Access to environmental documents is public and SETENA does a good job of providing this access and of making photocopies available. The next step is to digitize this information so that it is available online. Projects in the pipeline could also have a special section in the webpage for communities and stakeholders to be able to follow them.

- *Update Regulations through a Collaborative Process*

Chapter 2 discussed the importance of having a good process in order to produce good outcomes. The chapter presented a framework that identified a good EIA as one where impacts are seen from numerous disciplinary perspectives and values, at different scales and times, with the participation of a different range of actors, and a commitment to adaptive management and learning by doing. Chapter 3 provides clear evidence that the system in place for sustainable development decision making in Costa Rica, in coastal areas in particular, needs revisions. As it stands, the EA/EIA process is not meeting these standards, and it is not helping to achieve sustainable development.

The cases suggest the need to make five main changes to EA/EIA regulations in Costa Rica in terms of the issues that should be discussed: 1) strengthen the discussion of potential economic and social impacts (e.g. the case of Hotel RIU showed major omissions on these matters); 2) expand on the discussion of potential environmental impacts, beyond the current focus on geologic and hydrologic concerns (although these are very important and should continue to be discussed in depth); 3) look beyond the project level to issues of cumulative and regional impacts (i.e. different scales); 4) look beyond the short term (i.e. stop project phasing); and 5) make it possible to discuss mitigation measures more in depth, that could come from the developer, but also from communities and the government (e.g. there needs to be a discussion of how to incorporate the private sector to find solutions to infrastructure and other problems; the last section of this chapter suggests that either the property tax needs to be enhanced, or projects have to “pay their way”). In addition to these recommendations for the EA/EIAs, the threshold and values in the D1 and D2 forms need to be reviewed to make sure that projects

are being asked to submit an EIA or a softer environmental assessment document when appropriate.

The goal of these recommendations is to give the EIA process a fair chance at helping decision-makers balance environmental and socio-economic impacts. I would argue that these recommendations should be implemented through a collective effort led by the Ministry of Environment (including SETENA and the TAA), and including other relevant government agencies (i.e. the Tourism Institute, the Ministry of Housing and Urbanism, etc.), local and international environmental NGOs, universities, the private sector, and local communities. The Mixed Technical Advisory Commission referred to in the Environmental Law could be one of the ways to integrate these actors. Getting these stakeholders together to discuss these changes would be a good step forward to helping develop a learning process in Costa Rica for sustainable development. I would also suggest that rather than taking these recommendations as criticisms, these institutions should look at the great potential in Costa Rica and in their mandates. As said by Mario Boza et al., “Costa Rica Is a Laboratory, Not Ecotopia” (Boza et al., 1995). There needs to be a realization that this is the perfect time to work together on developing a learning process for sustainable development in Costa Rica.

As will be discussed below, there is a great opportunity at present in Costa Rica as the cadastre and land use plans of coastal areas are being developed. The EIA rules need to be updated in conjunction. Having clearer rules for development in coastal areas will ultimately benefit all stakeholders.

3. More and Better Planning

One of the challenges that coastal communities in Costa Rica faced with the rapid development was the vacuum created by the lack of land use plans, both in the 200 meter Maritime Terrestrial Zone (ZMT) and beyond. The lack of land use planning is a problem all over Costa Rica (urban planner, personal communication, January 2011). Although this is being addressed, the fact is that it will take time to build capacity at the local, regional, and national level to use these plans effectively, especially since these tools are not fixed in time but rather should adapt to circumstances. As mentioned by the legal specialist interviewed, “The most important thing about planning is that it is a process. Costa Rica needs to create a culture of planning” (legal specialist, personal communication, January 2011).

Several interviewees emphasized the need for plans to be more practical and noted that the answer to the problems with coastal development is not necessarily more regulations. One study noted that to construct a development project more than 380 permissions are required (environmental consultant, personal communication, January 2011). A business sector representative noted that there are so many laws that unfortunately the incentive is to go around them (business representative, personal communication, January 2011).

- *Use the ZMT as an Opportunity for Sustainable Coastal Development*

Despite the shortcomings with the Maritime Terrestrial Zone Law (LZMT) and its implementation, the law provides an incredible opportunity. First, out of the ZMT’s 200 meters, 50 meters are public and the other 150 meters can be given to a private developer as a concession, provided certain rules are met. Ownership of the land is in the State’s hands, which in theory gives it an opportunity to have a bigger say in how it is planned and developed. In

areas deemed apt for tourism and real estate development, the institutions in charge of giving the concessions can push for sustainability measures (e.g. green infrastructure). Hotels and real estate developments that want to locate in this area could be required to have more stringent construction codes and certifications, such as for example LEED certification (Leadership in Energy and Environmental Design, US Green Building Council). Developers wanting to locate in this valuable area should step up with more creative designs, such as for example by aiming to collect as much wastewater and runoff on site as possible and/or by collecting rainwater. ⁶⁹

In order to be able to tap into the opportunity of the ZMT, land use planning is essential. For example, the urban planner noted that the ZMT has not been very effective in practice because of the absence of coastal regulatory land use plans. Land use plans are important because they are the “regulations” of the ZMT law (urban planner, personal communication, April 2011). Without the plans, the law is left without “teeth”. The Attorney General of the Republic has been a big player in condemning illegal use of the ZMT, as seen through constructions in the public part of the ZMT, constructions without concessions in the concessional area, and speculation over concessions.

- *Improve Implementation of the ZMT and Other Tools for Coastal Management*

Most interviewees think that the Maritime Terrestrial Zone (ZMT) is a good law that should be kept, although there are problems in implementation that could be addressed by making changes to the regulations. One of the issues is that as of now, the law is not very flexible. The urban planner says that “The legal framework is very narrow, and does not allow

⁶⁹ The Tourism Institute is also interested in seeing how it can take advantage of the fact that according to the law, 25% of the ZMT investments should be destined to uses that benefit cooperatives, unions, and social sectors in the country. This is also a good opportunity.

for creativity” (urban planner, personal communication, January 2011). For example, the fact that the ZMT guarantees free access is one of the great advantages of the law. With good planning, the ZMT could also be used (if there is political will and community interest) to conserve important wetlands and to buffer coastal communities against the impacts of sea-level rise. According to a World Wildlife Fund project in Junquillal Beach, setbacks are a huge asset to adaptation planning. This specific project is using flood simulation models to bring the community, developers, and representatives from the provincial government together for the joint design of setback policies that maintain specific coastal stretches free of buildings, roads, and other infrastructure (WWF, n.d.).⁷⁰

One of the issues with the Maritime Terrestrial Zone (ZMT) law is the different interpretations and the overlapping jurisdictions. Some of the interviewees noted that the municipalities are the “administrators” of that land, and that it is the Tourism Institute (ICT) and the General Attorney of the Republic (PGR) who call the shots. One interviewee referred to the issue of concessions in the ZMT: “It should be simple. ICT develops the plan, then coordinates with INVU, and at the end the municipality implements it.” Others said that municipalities are more than administrators, by law, but they have been relegated to the role of administrators by the national government’s institutions. The university environmental specialist says that the ZMT law has saved coastal areas from degradation, but that it gives too much power to both the ICT and the municipality (university environmental specialist, personal communication, January 2011). There is a need for more clarity on who *is* and who *should be* in charge.

⁷⁰ WWF’s “Adaptation to Climate Change in Junquillal” project has an interesting video that can be accessed through the following link:
http://wwf.panda.org/what_we_do/endangered_species/marine_turtles/lac_marine_turtle_programme/projects/junquillal_leatherbacks/climate_change/

Despite the opportunity that the Maritime Terrestrial Zone (ZMT) provides, the legal specialist notes that there have been considerable problems with the law during the thirty-five years it has been in place in its current form. In his view, it is time to make changes to the regulations (legal specialist, personal communication, January 2011). The legal specialist and other interviewees noted at least three other major challenges. First, there is a sharp divide between the two-hundred-meter zone and the areas after this zone. This does not make sense from the ecosystem point of view (environmental consultant, legal specialist, urban planner, land use specialist, and university environmental specialist, personal communication, January 2011). The university environmental specialist added that coastal planning should have a community based vision, where people and livelihoods are also up front because, if not, sustainability does not work well (university environmental specialist, personal communication, January 2011). The second issue is that the two-hundred-meter zone also does not account for the ocean. Interviewees said that the country needs a vision of the ZMT that is not only land based, such as an Integrated Coastal Planning Approach (urban planner, marine specialist, university environmental specialist, personal communication, January 2011) (see World Bank, 1996). Third, concessions in the ZMT are property of the State, and in theory a person can only hold one concession and needs to be a citizen. Nevertheless, there have been irregularities with concessions signed to Corporations, "*Sociedades Anonimas*," and there has been considerable speculation. As the environmental consultant noted, the issue is that "the right has value." (environmental consultant, personal communication, January 2011). Other issues include developments that block public access to beaches, and illegal occupation of the ZMT, in some instances by locals who have lived there for years and have never applied for a concession.

The Four Seasons (Papagayo) and the JW Marriott (Hacienda Pinilla) apparently followed environmental guidelines more closely than hotels like RIU and the Allegro Papagayo. In terms of social integration though, Papagayo and Pinilla are both gated communities. They are examples of developments that find a way around the Maritime Terrestrial Zone law. Developers buy large plots of land (over 1000 hectares in some cases), and then develop master plans that include hotels and real estate investments, effectively privatizing the beaches. “They are basically left with an internal park of 200 meters” (urban planner, personal communication, January 2011). The number of these types of developments that are allowed should be better regulated.

- *Clarify the Role of the ICT in Coastal Land Use Planning*

Chapter 2 touched on the role of the Tourism Institute (ICT) in land use planning. ICT’s National Tourism Development Plan 2002-2012 divided the country into ten tourism regional areas and generated general land use and tourism development plans for each region (ICT, 2001). The goal of these regional plans was to identify areas appropriate as “tourism poles,” to guide development and investments. These are not land use plans, but rather regional plans meant to serve as inputs for the next tier of planning, which would be the typical land use plan.⁷¹

ICT has been developing coastal land use plans (*Planes Reguladores Costeros*) for some of these “tourism pole” areas (these should be at a scale of 1:10,000 or 1:1,000 depending on

⁷¹ The regional plans are very basic and do not provide enough detail. They differentiate areas for controlled development, centers for tourism attractions (i.e. the commercial area), and areas planned for tourism development. Basically, all the ZMT is zoned in one way or another for tourism. The maps also plan for densely populated areas and urban areas.

the area's needs), although it is not clear if these are ready and if they have been approved. Plans are also being developed for other areas that ICT is not covering (It is also not clear whether concessions have been given using the regional plans). The Cadastre project is basically doing the coastal land use plans for all the Pacific Coast from La Cruz in Guanacaste to Barú in the Central Pacific, except for what is being covered by ICT. The ProDUS has been doing the Osa region in the South Pacific. These plans pertain only to the ZMT area, in which ICT, INVU, and the municipalities have a say. The Cadastre project is doing land use plans for the areas beyond the ZMT for Guanacaste (where INVU and the municipalities are the main players) .

Despite the “tourism poles” idea, tourism development has not been concentrated because of the lack of public investment in roads and service infrastructure in these areas. In addition, there has been a lack of creative solutions, since developers could be required, through impact fees or other measures, to “pay their way” to develop this service infrastructure. This would also make an important contribution to these areas by helping build the public infrastructure. Another issue to keep in mind is that many of these hotels and real estate developments come and build their projects and then leave. The municipality is left with the responsibility of providing services to these areas in the short and longer term. They need to take this into account because, for now, they are just seeing the short-term gains from all the money that they are receiving from construction permits⁷². If these projects are built in flood plains for example, the burden of reconstructing the public side of the infrastructure may fall on local governments. According to the municipal official in Carrillo, flooding is already an issue in areas close to the Tempisque River.

⁷² The Municipality of Carrillo for example is now ranked 9th in terms of financial resources.

ICT has been instrumental in getting Costa Rica the image it has. Its efforts in tourism promotion are fantastic. It should keep doing this and also helping the private sector build more responsibly through efforts such as the Certificate of Sustainable Tourism (CTS).⁷³ It is not so evident though that ICT has been able to guide land use management, for obvious reasons since its mandate is tourism development. One interviewee noted that what ICT is doing at the moment “has no effect” (meaning the regional plans demarcating the areas apt for tourism at the 1:25,000 scale) (environmental consultant, personal communication, January 2011).⁷⁴

Other interviewees were a little more critical of ICT. The real estate specialist said that the institution does not have territorial vision, and no presence, despite the good intentions, and added that the problem with the law is that there is no institutional capacity. “ICT for example had plans for seven regions [meaning the regional plans] but they never used them, they were never applied.” One of the reasons for this is that there was never a concentrated effort to direct infrastructure investment to the “tourism poles” (real estate specialist, personal communication).

Another interviewee noted that “The Tourism Institute (ICT) incentivizes tourism but forgets about locals,” and another said that the “ICT has gone too far...the coast is very different throughout, but ICT thinks of the coast in uniformity” (real estate specialist, urban planner, personal communication, January 2011). According to the legal specialist, the issue at

⁷³ The Sustainable Tourism Certificate (*Certificado de Turismo Sostenible*) is an initiative promoted by ICT to rank hotels and other tourism businesses according to sustainability indicators, such as recycling, water use, etc. This has been a great contribution from ICT.

⁷⁴ There is an interesting article in *La Nación* by the director of planning of ICT. Mr. Lizano has been instrumental in helping ICT formulate and adopt the certification program for hotels, CTS, and in strengthening land use planning of coastal areas. (Lizano, 2010).

the municipal level is that there is no money and no personnel to work on these issues (legal specialist, personal communication, January 2011). Despite these issues, it is also important to keep in mind that ICT might have had to step in a scenario of no capacity at INVU and no capacity at the local level (the tax, or “canon,” from concessions goes to the respective municipalities, so they have an incentive to grant concessions). ICT has a stake in the Maritime Terrestrial Zone (ZMT) because, together with the municipalities, it is the main agency in charge of granting concessions for the area, and technically speaking, there needs to be a land use plan for the ZMT (*Plan Regulador Costero*) before the concession can be approved. As reviewed in Chapter 2, many of the plans have been made ad hoc by private companies that want to develop the area.

This might be the right time to question whether it makes sense for ICT to be responsible for the planning of the ZMT. Since land use planning is so important and it will become even more important as the country grows in population and economic productivity, it seems fit that the country strengthens the Land Use Planning Office at the Ministry of Housing and Urbanism (INVU) or at another umbrella organization such as the Ministry of Planning and Political Economy (MIDEPLAN). Without criticizing the tourism agency (ICT), it is arguable that the current way of doing things is not the best way to build capacity in communities. For one, it fragments the ecosystem from a coastal zone of 200 meters and then to everything else. ICT’s role might be more in tourism planning and promotion (marketing), rather than land use planning. This is an important distinction that is missed with the status quo of ICT at the lead.

- *Recover and Strengthen Planning in Costa Rica*

When and why did Costa Rica leave planning behind? The Planning Law that came into effect in the '50s and '60s was pioneering. But the law was never implemented. Planning never took off in Costa Rica from the law to actual plans and regulations. The legal specialist said in his interview that part of the issue is that the Ministry of Housing and Urbanism (INVU) is an institution with a very broad mandate (land use planning for the entire country), but with few financial resources and personnel. The Urbanism Division at INVU used to have sixty employees at one point in, and now there are only six. "INVU is very weak, but has a very strong mandate...the planning law is old, and there are very few resources. The Tourism Institute (ICT) on the other hand has a very limited mandate but it is thousand times stronger. There is capacity and presence." However, he notes that ICT might be looking at things too macro (in reference to the National Tourism Development Plan and the regional plans), instead of focusing on the local regulatory land use plan (*Plan Regulador*) (legal specialist, personal communication, January 2011).

An article published April 10 in *La Nación*, entitled "Firm builds luxury apartments despite lack of permits," talks about the twenty-four apartment buildings that will go up in Tilarán, Guanacaste, by Lake Arenal. There is a dispute at the moment regarding water availability, and whether the National Water and Sewers Agency (AyA) or the local water group granted the permit, and on what basis. The mayor made a statement saying that the company has complied with the municipality, and when asked about the scenic impact to the rural area due to the twenty-four apartment building's towers, he said "There is nothing to do because there is no land use plan (*La Nación*, April 9, 2011).

- *Strengthen Local Government Capacity for Land Use Planning and Taxation*

The environmental specialist at the Municipality of Carrillo pointed out to me that one way to get the attention of municipalities on the importance of planning for coastal development is to create awareness of how costly it is for local governments to have bad planning (e.g. the municipality often has to deal with issues such as waste in public areas, flooding, reduced water quality, among others). This is going to require information on the short and long-term costs and benefits of these investments. One of the stumbling points that the real estate specialist mentioned is the fact that municipalities are really happy with the development, and they are collecting big sums of money in the short term as a result (real estate specialist, personal communication, January 2011).

In the United States, states like Florida found it profitable to house second homes, mainly because the owners pay taxes but are out of the area for several months per year; thus consumption is smaller than for residents (W. Wheaton, 11.433 lecture, Real Estate Economics, Fall 2010). The argument can be made that this niche would be beneficial for coastal communities in Costa Rica, although the municipalities as of now do not have adequate property tax collection systems or the capacity to do so in a way that is profitable. This will take time to develop. The other issue is capacity building of municipalities so they can spend the money right. Even without good tax systems, these municipalities are getting in the short term considerable amounts of money from “canons,” permits of construction, and sales of land.

Municipalities may find themselves in fiscal trouble if the short term payments stop coming, while demand for services increases. The cadastre and land use plans being developed

are essential for coastal municipalities to be able to build their financial capacity to provide services. Coastal areas should also think about having developers pay as much as possible for building public infrastructure. One of the barriers to overcome is that the challenges of community organization of coastal areas are especially acute in small towns, and this could affect particularly participation from developers. In addition to the gated communities, many of the real estate projects are rented out to vacationers and so, together with hotels, the populations in these areas change constantly. This is likely to decrease participation, and this is problematic because if these were residents, they could organize as a community for services such as trash collection and policing. In their absence, a good plan is for the local government to provide these services under a “fee for service” structure. The problem with many of these innovations is that they require information and management.

As capacity at the local level builds up, there is potential to work at the inter-municipal level (*mancomunado*), which means that a set of municipalities get together for this purpose and share the costs (urban planner, personal communication, January 2011). It could be good to explore what the current Cadastre Project is doing to create capacity at the regional level to manage the land use plans that this project is expecting to provide them with.

- *Create a Vision for Coastal Development*

Where do coastal communities see themselves in the next five years? In the next fifteen years? How do people in Costa Rica feel about these issues? A useful way to discuss this is by using direct examples and images (Flaxman et al., 2005). Are the coastal areas of Costa Rica aiming for Cancun or Baja, California-style developments? If not, what is the alternative and

what does it look like? One of the most important contributions that planning can make is to help get communities organized under particular goals and areas of interventions to help achieve their goals and aspirations. To increase changes for effective implementation, this should be participatory process. More and more, coastal communities will need to be able to manage change in economic, social, and environmental factors, and at the same time prepare for future changes such as climate change. Having a road map, a vision, and getting the community behind the effort is probably one of the most important tasks. This ultimately should be their decision.

Conclusion

We are all learning from experience about better ways to develop more resilient economies and societies, in ways that are respectful of the environment and that take long-term impacts into account. Coastal areas in Costa Rica are early in their development process and therefore provide an ideal setting to make sustainable development choices. Despite the contradictions currently seen in Costa Rica, this developing country—highly regarded as a pioneer in conservation—still has time to turn the tides. Laws such as the Environmental Law and the Maritime Terrestrial Zone Law provide ample opportunity for the public sector to implement more stringent controls. The problem with this and other aspects of the sustainable development framework has been at the decision making and implementation level. As it is, the framework in Costa Rica at the project level (EIA), the municipal level (Land Use Planning), and the national level (e.g. the national development plans and the tourism development plans), has not been able to deliver the intended results. Projects can be pushed further (e.g.

treatment plants, green designs), and there needs to be a way to bridge the land use planning gap. Coastal communities are under great pressure in Costa Rica at the moment, but with the right planning, these areas can take advantage of private investment to take off and become models of sustainable development.

References

- Arce A., S. (2011, March 15). ICT y Salud objetan informe mundial sobre turismo en el país. [ICT and Health Object World Report on Tourism in the Country]. *La Nación*. Retrieved from <http://www.nacion.com/2011-03-16/Economia/NotasSecundarias/Economia2716008.aspx>
- Arley, A. (2009, October 30). Hotel en Guanacaste abre hoy en medio de denuncias ambientales. [Hotel in Guanacaste Opens Today Amid Environmental Complaints]. *La Nación*. Retrieved from http://www.nacion.com/ln_ee/2009/octubre/30/pais2142461.html
- Avalos R., A. (2008, February 4). Cierre de Hotel Allegro Papagayo será este martes. [Hotel Allegro Papagayo will be Closed this Tuesday]. *La Nación*. Retrieved from http://www.nacion.com/ln_ee/2008/febrero/04/pais1412105.html
- Avalos R., A. (2008, November 25). Ministerio de Salud impide reinicio de obras a Hotel RIU. [Ministry of Health Impedes Hotel RIU from Restarting Works]. *La Nación*. Retrieved from http://www.nacion.com/ln_ee/2008/noviembre/25/pais1787736.html
- Avalos R., A. (2009, March 16). Hemorragia masiva mató a trabajador del Hotel Riu. [Massive Hemorrhage Killed Worker at Hotel Riu]. *La Nación*. Retrieved from http://www.nacion.com/ln_ee/2009/marzo/16/pais1906379.html
- Boza, M. A., Jukofsky, D., & Wille, C. (1995). Costa Rica Is a Laboratory, Not Ecotopia. *Conservation Biology*, 9(3), 684-685.
- Brenes Valverde, J. (2010). Directriz del control del uso del suelo temporal hasta que entre en vigencia el nuevo plan regulador integral de los cantones de Liberia y Carrillo, Guanacaste [Interim Guidelines for Land Use for Liberia and Carrillo while the Land Use Plans Come into Effect]. San Jose, Costa Rica.
- Camacho Sandoval, A.C. (2009). *Acueducto Sardinal: Guerra Interna por el Agua*. [Sardinal Aqueduct: Internal Water War]. Global Water Partnership (GWP), Central America. Retrieved from <http://www.gwpcentroamerica.org/uploaded/content/article/1140882128.pdf>
- Cashmore, M., Bond, A., & Cobb, D. (2007). The Contribution of Environmental Assesment to Sustainable Development: Toward a Richer Empirical Understanding. *Environmental Management*, 40, 516-530.
- Center for Responsible Travel. (2009). *Legal and Institutional Framework Related to Coastal Tourism Development*. San José, Costa Rica: Cabrera, J.

Center for Responsible Travel. (2009). *Marco Legal y Estructura Institucional del Desarrollo Turístico e Inmobiliario en la Costa Pacífica de Costa Rica*. [Legal Framework and Institutional Structure of Tourism and Real Estate Development in the Pacific Coast of Costa Rica. San José, Costa Rica: Cabrera, J., & Sánchez, S.

Center for Responsible Travel. (2010). *Análisis del Polo Turístico Golfo de Papagayo como un modelo único gubernamental de concesión turística*. [Analysis of the Papagayo Tourism Pole as a Unique Government Model for Tourism Concession]. San Jose, Costa Rica: Salas Roiz, A. .

Center for Responsible Travel. (2010, April). *The Impact of Tourism Related Development along Costa Rica's Pacific Coast: Summary Report*. Washington, DC: Honey, M., Vargas, E., & Durham, W.

Centro Científico Tropical (CCT). (1995). *Análisis del impacto del turismo sobre la comunidad y sobre la reserva biológica del bosque nuboso Monteverde*. [Analysis of Tourism's Impact on the Community and Biological Reserve of the Monteverde Cloud Forest]. San José, Costa Rica: Figueroa, L.F.

Clark, J. R. (1996). *Coastal Zone Management Handbook*. Boca Raton, FL: CRC Press, Inc.

Clark, J. R. (1998). *Coastal Seas: The Conservation Challenge*. London, UK: Blackwell Science.

Costa Rica Hoy. (2009, July 10). Sala IV acoge amparo contra Hotel RIU. [Constitutional Court Accepts Complaint Against Hotel RIU]. Retrieved from <http://costaricahoy.info/nacionales/sala-iv-acoge-amparo-contra-hotel-riu/19152/>

Costa Rica Hoy. (2011, February 14). Entrevista – José Lino Chaves: En materia ambiental falla el Estado como un todo. [Interview – José Lino Chaves: In Environmental Matters, the State as a Whole is Failing]. Interview conducted by Rosita Argüello. Retrieved from <http://costaricahoy.info/nacionales/entrevista-jose-lino-chaves-en-materia-ambiental-falla-el-estado-como-un-todo/84397/>

Costa Rica Tourism.co.cr. (2009, August 3). RIU Plans a Second Hotel in Guanacaste. Retrieved from <http://www.tourism.co.cr/costa-rica-tourism-news/costa-rica-tourism-news/riu-plans-a-second-hotel-in-guanacaste.html>

Costa Rica, Asamblea Legislativa. Ley Orgánica del Ambiente [Environmental Law], No. 7554. La Gaceta, Diario Oficial, No. 215 (1995, November 13).

Economic Commission for Latin America and the Caribbean (ECLAC). (2008). Integrated hotel and real estate complexes: investments and business strategies. In ECLAC, *Foreign Investment in Latin America and the Caribbean, 2008*. Santiago, Chile.

ELPAIS.cr. (2011, April 1). Defensa de la Evaluación de Impacto Ambiental (EIA). [In Defense of the EIA]. *Llamado urgente por el país*. Retrieved from <http://www.elpais.cr/articulos.php?id=43771> and <http://llamadourgenteporelpais.blogspot.com>

Emberton, R., & Therivel, R. (2009). Sustainable Development and Sustainably Appraisal. In P. Morris & R. Therivel (Eds.), *Methods of Environmental Impact Assessment*. 3rd edition. Oxon, UK: Routledge.

Flaxman et al. (2005). Alternative Futures for the Region of Loreto, Baja California Sur, Mexico. Harvard University, in cooperation with the Municipality of Loreto, B.C.S.

Fundación DEMUCA, & AECl. (2001). Reflexiones para el Debate No 6: *Ordenamiento Y Planificación Territorial*. [Land Use and Territorial Planning]. San José, Costa Rica.

Fundación DEMUCA. (2005). Reflexiones para el Debate No. 8: Manual para la Gestión Municipal de la Zona Marítimo Terrestre en Costa Rica. [Handbook for the Municipal Administration of the Maritime Terrestrial Zone in Costa Rica]. San José, Costa Rica.

Gibson, R.B. (2001) Specification of sustainability-based environmental assessment decision criteria and implications for determining 'significance' in environmental assessment. *Canadian Environmental Assessment Agency Research and Development Programme*. Ottawa, Canada.

Glasson, J., Therivel, R., & Chadwick, A. (2005). *Introduction to Environmental Impact Assessment*. 3rd Edition. Oxon, UK: Routledge.

Hanson, Craig. (2011, March 7). Case for Saving Coral Reefs is Economic as Well as Conservational. World Resources Institute. Retrieved from <http://www.wri.org/stories/2011/03/case-saving-coral-reefs-economic-well-conservational>

Herrera, M. U. (2008, February 3). Excesiva perforación de pozos: Desorden amenaza reservas de agua en la costa del Pacífico. [Excessive perforation of aquifers: Disorder threatens water reserves in the Pacific Coast]. *La Nación*. Retrieved from http://www.nacion.com/ln_ee/2008/febrero/03/pais1408422.html

Instituto Costarricense de Turismo (ICT). (2001). *Plan Nacional de Desarrollo Turístico de Costa Rica 2002-2012*. [National Tourism Development Plan for Costa Rica]. San José, Costa Rica.

Instituto Nacional de Estadística y Censos de Costa Rica, & Centro Centroamericano de Población de la Universidad de Costa Rica. (2002). *Estimaciones y Proyecciones de Población 1970-2050*. [Population Estimates and Forecasts 1970-2050]. San José, Costa Rica.

Instituto Nacional de Estadística y Censos de Costa Rica. (2010). *Anuario Estadístico para 2009: Turismo*. [Statistics Yearbook for 2009: Tourism]. Retrieved from <http://www.inec.go.cr/Web/Home/GeneradorPagina.aspx>

Kemp, R., Saeed P., & Gibson, R. (2005). Governance for sustainable development: moving from theory to practice. *International Journal of Sustainable Development*, 8(1/2).

Koens, J., Dieperink, C., & Miranda, M. (2009). Ecotourism as a development strategy: experiences from Costa Rica. *Environment, Development and Sustainability*, 11 (6), 1225-1237.

La Prensa Libre. (2007, July 14). Empieza Construcción de Marina Turística en Quepos. [Construction of Tourist Marina Begins in Quepos Begins]. Retrieved from <http://www.prensalibre.co.cr/2007/julio/14/nacionales10.php>

León Rodríguez, E. (2009). *Análisis Jurídico de los Planes Reguladores Costeros Elaborados por Particulares*. Tesis para Optar por el Grado de Licenciatura en Derecho. Alternativas Legales. Universidad de Costa Rica, Facultad de Derecho. San José, Costa Rica. Retrieved from <http://www.iiij.derecho.ucr.ac.cr/archivos/documentacion/tesis/2009/Tesis%20Elizabeth%20Leon%20Rodriguez.pdf>

Lizano Rodríguez, R. (2010, December 12). El rol del ICT en la zona marítimo-terrestre: Los posibles abusos en la zona costera no cuentan con la “complicidad” del ICT. [The Role of ICT in the Maritime Terrestrial Zone: No Complicity of ICT on Possible Abuses in the Coastal Zone]. *La Nación*. Retrieved from <http://www.nacion.com/2010-12-28/Opinion/Foro/Opinion2634276.aspx>

Massachusetts Office of Coastal Zone Management. (2001). *Massachusetts Clean Marina Guide: Strategies to Reduce Environmental Impacts*. Epsilon Associates, Inc.

McDonald, M. (2010, January 29). Costa Rica rises to third on Yale's green list. *The Tico Times*. Retrieved from http://www.ticotimes.net/dailyarchive/2010_01/012910.htm#story1

Ministerio de Planificación Nacional y Política Económica (MIDEPLAN) (2009). *Costa Rica: estadísticas regionales 2001-2008* [Costa Rica: Regional Statistics 2001-2008]. San José, Costa Rica.

Miranda, M. (2003). *Institutional capacities for sustainable process: Experiences from Costa Rica*. Netherlands Geographical Studies. Utrecht.

National Oceanic and Atmospheric Administration (NOAA). (2011, March 29, Revised). Coastal zone management involves managing coastal areas to balance environmental, economic,

human health, and human activities.). National Ocean Service (NOS). Retrieved from <http://oceanservice.noaa.gov/facts/czm.html>

Ostrom, E. (1994). Designing Complexity to Govern Complexity. In *Property Rights and the Environment: Social and Ecological Issues*, Susan H. & Mohan M. (Eds.). Washington, D. C.: The World Bank.

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.

Pratt, L. (2002). *Logros y Retos del Turismo Costarricense*. [Achievements and Challenges of Tourism in Costa Rica]. Centro Latinoamericano de Competitividad y Desarrollo Sostenible (CLADS). INCAE Business School, Costa Rica.

Programa de Investigación en Desarrollo Urbano Sostenible (ProDUS). Propuesta para el Plan Regulador Costero de Isla Chira. San José, Costa Rica.

Programa de las Naciones Unidas para el Medio Ambiente (PNUMA). (1998): *Encadenamientos globales de producción: consumidores del norte, productores del sur y sostenibilidad*. [Global Value Chains: Consumers from the North, Producers from the South, and Sustainability]. INCAE Business School, Costa Rica.

Programa Estado de la Nación. (2007). Evolución y Estado Actual del Sector Construcción: Impacto en la Economía Nacional y Desafíos [Current State of the Construction Sector and its Evolution: National Economic Impact and Challenges]. In *Decimotercer Informe sobre el Estado de la Nación* [13th Report on the State of the Nation]. San José, Costa Rica.

Programa Estado de la Nación. (2010). Capítulo 1: Sinopsis. In *Decimosexto Informe sobre el Estado de la Nación en Desarrollo Humano Sostenible*. [17th Report on the State of the Nation in Human Sustainable Development]. San José, Costa Rica.

Rojas, J. (2007, March 26). 21 marinas quieren invertir aquí más de \$400 millones. [21 Marinas Want to Invest More than \$400 Million]. *La Nación*. Retrieved from http://www.nacion.com/ln_ee/2007/marzo/26/economia1041184.html

Rojas, R. (2011, March 19). Diplomáticos de Estados Unidos: Costa Rica no es un paraíso. [Diplomats in the USA: Costa Rica is not Paradise]. *La Nación*. Retrieved from <http://www.nacion.com/2011-03-20/Investigacion/NotasSecundarias/Investigacion2719563.aspx>

Román, M. (2007). *Turismo mercado inmobiliario y desarrollo costero sostenible*. [Presentation slides]. Retrieved from http://www.una.ac.cr/redibec-cisda/documentos/marcela_roman.pdf

Secretaria Técnica Nacional Ambiental (SETENA). (2004). *Decreto N º32079-MINAE, Instructivo llenado D2, formulario, y Código de Buenas Prácticas Ambientales*. Retrieved from <http://www.setena.go.cr/formularios.html>

Secretaria Técnica Nacional Ambiental (SETENA). *Manual de Instrumentos Técnicos para el Proceso de Evaluación de Impacto Ambiental*. [Manual of Technical Instruments to Evaluate Environmental Impact].

Secretaria Técnica Nacional Ambiental (SETENA). Environmental Impact Statement for Marina Pez Vela, and Project File.

Secretaria Técnica Nacional Ambiental (SETENA). Environmental Management Plan for Hotel RIU, and Project File.

Secretaria Técnica Nacional Ambiental (SETENA). Project File for Coco-Ocotol Aqueduct.

Secretaria Técnica Nacional Ambiental (SETENA). Project File for Vista Perfecta Phase II Apartments.

Secretaria Técnica Nacional Ambiental (SETENA). (n.d.). *Qué es la Evaluación de Impacto Ambiental (EIA)?* [What is an Environmental Impact Assessment?]. Retrieved from <http://www.setena.go.cr/viabilidades.html>

Steinberg, P. (2001). *Environmental Leadership in Developing Countries: Transnational Relations and Biodiversity Policy in Costa Rica and Bolivia*. MIT Press.

Susskind, L., & Cruikshank, J (1987). *Breaking the Impasse: Consensual Approaches to Resolving Public Disputes*. New York, New York, USA: Basic Books.

The World Bank. (1996). *Guidelines for Integrated Coastal Zone Management*. Environmentally Sustainable Development Studies and Monographs Series No. 9. Washington, D.C.: Jan C. Post and Carl G. Lundin, Editors.

Toman, M. (1998). Sustainable Decision-making: The State of the Art from an Economics Perspective. Discussion Paper 98-39. *Resources for the Future*.

Tribunal Ambiental Administrativo (TAA). (2008). *Tribunal Ambiental paraliza 11 proyectos en Guanacaste e investiga 5 más*. [Environmental Tribunal Stops 11 Projects in Guanacaste and Investigates Five More]. Boletín de Noticias.

Tribunal Ambiental Administrativo (TAA). (2008, May). Barrida Ambiental de Guanacaste En Fotos. [Environmental Field Visit in Guanacaste, in Pictures].

Tribunal Ambiental Administrativo (TAA). (n.d.). Acerca del Tribunal Ambiental Administrativo (TAA). [About the TAA]. Retrieved from <http://www.tribunalambiental.org/index.php/acerca-del-taa>

Tribunal Ambiental Administrativo. (2011). Las Barridas Ambientales. Retrieved from <http://www.tribunalambiental.org/index.php/barridas-ambientales>

Unidad Ejecutora del Programa de Regularización de Catastro y Registro [Cadastral Project]. (2008). *Análisis del Mercado Inmobiliario-Hipotecario de Costa Rica. Características y Dinámica Reciente. Parte I*. [Analysis of the Real Estate Sector in Costa Rica: Recent Characteristics and Dynamic]. San José, Costa Rica: Roman Forastelli, M.

United Nations Development Program (UNDP). (2010). *Human Development Indicators. Costa Rica Country Profile*. Retrieved from <http://hdrstats.undp.org/en/countries/profiles/CRI.html>

United Nations Environment Programme (UNEP). (2009). *Sustainable Coastal Tourism: An Integrated Planning and Management Approach*. Paris, France.

University of Costa Rica, University Council. (November, 2009). *Implicaciones del Proyecto de Ampliación del Acueducto del Coco-Ocotol, Guanacaste, conocido como Sardinal*. [Implications of the Coco-Ocotol Project]. <http://www.cu.ucr.ac.cr/document/informeFinalSardinal.pdf>

Vargas, N. (2010, May 21). Setena ordena paralizar obras del acueducto Sardinal-Ocotol. [SETENA Orders Stopping Works on the Sardinal-Ocotol Aqueduct]. *La Nación*. Retrieved from <http://www.nacion.com/2010-05-21/EIPais/UltimaHora/EIPais2380518.aspx>

Villa, L. (2011, April 9). Empresa levanta condominios de lujo pese a dudas por permisos. [Developer Constructs Luxury Apartments Despite Doubts About Permits]. *La Nación*. Retrieved from <http://www.nacion.com/2011-04-10/EIPais/FotoVideoDestacado/EIPais2733698.aspx>

Villegas S., J. (2010, November 25). Setena dio viabilidad ambiental a proyecto. [SETENA Gives Environmental Viability to the Sardinal Project]. *La Nación*. Retrieved from <http://www.nacion.com/2010-11-27/EIPais/NotasSecundarias/EIPais2604179.aspx>

Vindas, L. (2011, February 8). Programa BID-Catastro dará planes reguladores para Guanacaste y ZMT. [IADB-Cadastral Program will Provide Regulatory Plans for Guanacaste and the ZMT]. *El Financiero*. Retrieved from http://www.elfinancierocr.com/ef_archivo/2011/febrero/13/economia2677314.html

World Resources Institute. EarthTrends: Environmental Information. (2003). *Country Profile for Costa Rica for theme: Biodiversity and Protected Areas*. Washington, D.C. Retrieved from http://earthtrends.wri.org/pdf_library/country_profiles/bio_cou_188.pdf

World Wildlife Fund. (n.d). *Adaptation to Climate Change in Junquillal*. Retrieved from http://wwf.panda.org/what_we_do/endangered_species/marine_turtles/lac_marine_turtle_programme/projects/junquillal_leatherbacks/climate_change/

Yale Center for Environmental Law & Policy, Yale University, and Center for International Earth Science Information Network, Columbia University. (2010). Environmental Performance Index 2010. Retrieved from <http://epi.yale.edu/>

Appendix 1 – Excerpt from SETENA’s D1 Form Template (Scoring Matrix)

Figure A.1. Excerpt from SETENA’s D1 Form Template

Component/Subcomponent		CASE 1 (Value=1)	CASE 2 (Value=2)	CASE 3 (Value=3)	CASE 4 (Value=4)	CASE 5 (Value=5)	y	Regulatory Fmk (z)					X= z*y	Envt. Measures Annex #	Points
								a	b	c	d	e			
2. Consumption/Effects	2.1. Water	2.1.1 Existing public aqueduct		Water consumption is less than 50 m ³ /month		Water consumption is between 50 and 200 m ³ /month				3			0.00	0.00	
		2.1.2 Surface water			Water consumption is less than 25% of the residual volume flow	Water consumption is between 25% - 50% of the residual volume flow	Water consumption is greater than 50% of the residual volume flow (but below 100%)				2		0.00		
		2.1.3 Groundwater			Water consumption is less than 50 m ³ /day	Water consumption is between 50 and 200 m ³ /day	Water consumption is between 200 and 500 m ³ /day				2		0.00		
	2.2. Land	2.2.1 Land use change		No change						3			0.00	0.00	
		2.3. Energy	2.3.1 Self-sufficiency		2.3.1.1 Bio-fuels	Energy generated is less than 240 Mwh/year	Energy generated is between 240 - 2,500 Mwh/year	Energy generated is between 2,500 - 5,000 Mwh/year	Energy generated is between 5,000 - 10,000 Mwh/year	Energy generated is more than 10,000 Mwh/year		3		0.00	0.00
	2.3.1.2 Fossil fuels				Energy generated is less than 240 Mwh/year	Energy generated is between 240 - 500 Mwh/year	Energy generated is between 500 - 1,200 Mwh/year	Energy generated is between 1,200 - 2,400 Mwh/year	Energy generated is more than 2,400 Mwh/year		3		0.00		
	2.3.2 External supply		Energy consumption is less than 240 Mwh/year (or less than 360,000 liters of fuel per year, or 12 T.J/year)		Energy consumption is between 240 - 1200 Mwh/year (or between 360,000 - 1,800,000 liters of fuel per year, or between 12 - 60 T.J/year)		Energy consumption is more than 1200 Mwh/year (or 1.800.000 L of fuel per year, or 60 T.J/year).			2		0.00	0.00		
	2.4. Biotypes	2.4.1 Fauna		No impact			Impact		Impact endangered or indicator species			2		0.00	0.00
		2.4.2 Flora		No impact		Impact on flora but no cutting of trees	Isolated trees cut in areas of no significant forest cover	Pockets of trees eliminated in areas less than 2 hectares in size	Tree felling in forested area			2		0.00	0.00

Source: SETENA (n.d.). Link to D1 form: <http://www.setena.go.cr/formularios.html>

Appendix 2 – Employment and Poverty Changes in the Chorotega and Central Pacific Regions (2001-2008)

Table A.2.1. Employment Change per Sector in the Chorotega and Central Pacific Regions (2001-2008)

% of Total Employment per Two Sectors									
	2001	2002	2003	2004	2005	2006	2007	2008	%Change (01 - 08)
Chorotega (Guanacaste)									
Total Employment	112,644	110,971	111,047	115,650	123,273	123,027	126,444	134,947	19.80%
Construction (%)	6.3	6.0	5.3	7.4	7.6	7.7	10.0	10.9	73.02%
Commerce, Hotels and Restaurants (%)	25.4	25.3	25.8	26.0	26.8	27.6	25.2	26.3	3.54%
Agriculture, Livestock, Fishing (%)	25.7	27.6	27.6	24.8	24.6	21.3	20.0	18.2	-29.18%
Manufacturing Industries, Mining, Quarries (%)	7.4	7.4	8.6	8.4	9.1	8.5	8.1	7.7	4.05%
Public Services and Other (%)	35.2	33.7	32.7	33.3	31.9	34.9	36.6	36.8	4.55%
Central Pacific									
Total Employment	76,863	79,367	81,620	84,707	87,768	87,898	97,019	91,835	19.48%
Construction (%)	8.0	8.4	9.0	8.7	10.3	13.3	12.6	11.5	43.75%
Commerce, Hotels and Restaurants (%)	28.4	25.8	26.0	27.6	24.1	27.2	27.0	27.2	-4.23%
Agriculture, Livestock, Fishing (%)	19.7	21.7	18.9	18.6	20.1	18.0	12.9	13.2	-32.99%
Manufacturing Industries, Mining, Quarries (%)	12.3	12.4	13.9	13.6	11.3	10.4	12.9	11.6	-5.69%
Public Services and Other (%)	31.5	31.7	32.3	31.6	34.3	31.1	34.6	36.5	15.87%

Source: Data from MIDEPLAN, 2009. Percentage change calculations by author.

Table A.2.2. Poverty Change in the Chorotega and Central Pacific Regions (2001-2008)

Poverty (household) -										
(In percentage terms)	2001	2002	2003	2004	2005	2006	2007	2008	2009	Percentage Change (01-09)
Chorotega Region										
Not poor	68.8	67.3	69.4	66.9	70.7	65.6	74.9	74.0	75.9	10.32%
Basic Needs Not Met	18.9	19.0	19.7	23.1	19.2	22.3	18.7	19.4	16.4	-13.23%
Extreme Poverty	12.4	13.7	10.9	10.0	10.1	12.1	6.3	6.5	7.7	-37.90%
Central Pacific										
Not poor	70.4	73.5	74.0	74.4	72.8	73.7	79.2	74.3	73.8	4.83%
Basic Needs Not Met	18.8	19.4	19.8	17.7	18.8	20.8	16.7	20.0	20.6	9.57%
Extreme Poverty	10.9	7.1	6.2	7.9	8.4	5.5	4.0	5.8	5.6	-48.62%
Costa Rica										
Not poor	79.7	79.4	81.5	78.3	78.8	79.8	83.3	82.3	81.5	2.26%
Basic Needs Not Met	14.4	14.9	13.4	16.1	15.6	14.9	13.4	14.2	14.3	-0.69%
Extreme Poverty	5.9	5.7	5.1	5.6	5.6	5.3	3.3	3.5	4.2	-28.81%

Source: Data from MIDEPLAN, 2009. Percentage change calculations by author.

Appendix 3 – Main Points from Hotel RIU’s Environmental Management Plan

Location: Playa Matapalo, Sardinal District. Municipality of Carrillo, Guanacaste Province (Chorotega Region)

Table A.3. Discussion of Main Environmental Impacts and Mitigation Measures (D1 and PGA documents, Hotel RIU) ¹.

RESOURCE CONSUMPTION	VALUE (1-5, 5 being the highest)	MULT. FACTOR	NOTES/ANALYSIS
WATER (Groundwater)	5: Water consumption is expected to be greater than 500 m ³ per day.	2	The developer notes that “there will be no lack of water for the community.” The only observation made by SETENA is that the permits are being processed to determine the optimal extraction from the wells. There is a contradiction in the project file. The technical documents note that the aquifer inside the property has the capacity to meet water demand, but has a high risk of saline intrusion. Other documents say that there is no risk of saline intrusion. The developer notes that a desalination plant will be constructed, but there are no details of when this would be done, and no analysis of the energy demand that this would entail.
LAND USE	5: Modification of land use	3	The developer notes that land use will change from “disuse to a tourism use, in accordance with the growth of the area.” Nevertheless, note that the area did not have a land use plan. The developer plans to build another hotel, but this is not mentioned in the RIU documents. There needs to be a more long term and cumulative impacts vision, especially in this case since it is known that this company owns a large plot of land in the area. Having a land use plan for the area could help fill this gap.
ENERGY (From Fossil Fuels)	5: More than 2400 MWh/yr		The hotel paid for construction of a 3km electricity transmission line from the (then to be constructed) substation in Nuevo Colon (COOPEGUANACASTE). The hotel also has a diesel plant in case of emergency. No mitigation measures are given.
FAUNA	1: No effect	2	Sediments from movement of soils for the project are not expected to have a significant effect on marine fauna. An important reef was identified in the area of influence that “requires protection and monitoring to ensure integrity.”
FLORA	3 : Isolated trees eliminated in no-forest areas if necessary	2	In several places, as here, there seems to be a discrepancy with the total number from the multiplication factor and the value. For example, for Flora, another chart shows a total score of 12. The reason for this is not very clear.
INFRASTRUCTURE			The developer notes that it will build structures with all the security norms that guarantee their stability, but in the D1 it does not mention liquefaction risk. The project will expand and repair the public road that is used to access the property from the neighboring town of Nueva Colon (3 km).

¹ The values and multiplication factors are part of SETENA’s methodology to determine the environmental significance of the project. For example, this seems to have been important in Hotel RIU, which was not required to submit an EIA but rather a smaller Environmental Management Plan (PGA).

IMPACT	VALUE	MULT. FACTOR	NOTES/ANALYSIS
AIR a) emissions (mobile sources) b) noise, etc.	4 3: There are, but within the limit of the regulation	3 3	No mitigation measures included
WATER a) Underground Runoff b) Ordinary Residual Waters c) Special Residual Waters	a) 2: Increase in flow is more than 10% but less than 25% ("not significant") b) 1: Production of general ordinary residual waters, and construction of treatment plant c) 3: More than 50 m ³ /month but less than 200 m ³ /month	2 2 2	<u>Runoff:</u> The first thing to note is that the studies do not seem to be looking at good records on precipitation and other key climatic variables. There is no analysis of how the increase in impermeable areas would alter the hydrology in the area. Apparently the rain water will be channeled to a receptor stream that goes through the property, but no specifications are given regarding the capacity of the stream to deal with the increase in runoff. A technical study notes that the infiltration tests found two zones of impermeable material, but then later states that there is no significant impact on runoff and drainage (and there is no discussion of what it could be like in the rainy season). <u>Agrochemicals</u> will be used for the gardens, but there is not discussion of this. <u>Wastewater:</u> The technical studies note that a treatment plant is absolutely necessary because of the high density of the development and the risk of pollution to water resources. The project notes that the discharge will be used for irrigation of gardens, and considers that therefore, "the use of water will be rational" (annex 3). Not enough details are provided though, and SETENA does not seem to make recommendations or to ask many questions. <u>Special Residual Waters:</u> the documents note that liquid wastes typical of the construction process will be generated, but there is no account of how they will be handled.
SOILS a) Ordinary Solid residues b) Special solid residue: c) Debris: d) Movement of Soil e) Slope	a) 5: Final disposal is a land fill. b) 5: Final disposal is a landfill. Same mitigation measures. c) 4: Debris must be transported in an amount greater than 100m ³ d) 2: Movement of soil and filling, but no transportation outside the area of the project. e) 1: Slope: between 1 and 15% f) 1: maximum density of 50	3 3 3 2 3	<u>Ordinary solid residues:</u> Final disposal is a land fill, so this category receives the highest penalty value of 5. It is interesting to note that a value of 1 would be received if the hotel could classify waste in order to recover, reutilize, or recycle it, although final disposal would most likely be a landfill as well. There is no consideration of whether the landfill has the capacity to absorb this increase in waste. <u>Earthquake and Liquefaction Risk:</u> The earthquake risk is high in this area. Regarding liquefaction risk, there are many discrepancies in the file, with some studies saying that the risk is high, others saying that it is not. Note that statements were based on water table measures taken in the dry season. The AP is an alluvial plane. <u>Movement of soil:</u> More than 10,000 m ³ of earth will be removed for construction, but the project notes that it will be disposed in areas of the property where there is no vegetation <u>Slope:</u> The technical studies note that the AP is not very affected by rain erosion because it is flat (slope between 1 and 15%), but that the AIP has high slope areas that are very affected. However, note in one of the monitoring memos, SETENA recommends strengthening the program for slope stabilization and erosion control to avoid soil erosion.

f) Density of people g) Density of construction h) traffic	inhabitants per hectare g) 2: construction coverage is less than 25% of the property h) 5: Generates new traffic in proportion greater than 50% of the capacity installed	3 2 3	<u>Density</u> : The project is expected to have an expected maximum density of 50 inhabitants per hectare. Note that this measurement is based on the entire plot owned by the developer, and not the Project Area only (1400 guests, + staff, in an area of 5ha). The project is classified as high density, and yet there is no analysis of change. This seems lacking in this study, particularly seeing the rapid shift to high density. <u>Traffic</u> : It is expected that traffic flow will consist of 20 trucks with materials per day in construction, and a maximum of 200 units per day during operation including taxis and personal vehicles. The mitigation measure provided was to pave the road.
HUMAN a) Employment b) cultural and landscape	a) The project is expected to generate more than 100 new positions. b) 3: does not cause disequilibrium in the existing landscape; and 1: project does not affect the scientific, architectural, or archeological patrimony	2 3 and 2	Migration is noted as zero (unlikely in an area very close to the Nicaraguan border). <u>Landscape</u> : The PGA notes that the infrastructure is being built in a rural zone and that it does not cause disequilibrium in the existing landscape and scenery, noting that “the project is in accordance with the regional development.” It can be argued that this is a very subjective statement. Many are raising their voices to insist that the hotel is out of proportion. Also, note that this is a beach where turtles have historically come to lay their eggs.
OTHER RISK a) Fossil Fuels b) agrochemicals c) dangerous substances d) uncontrollable burns	a) 2: The project is expected to consume, manage, and/or store a quantity less than 5000 liters per month b) 4: for the gardens	2 2	<u>Fire risk from uncontrollable burns</u> : This risk is deemed not significant, despite being common in the region. The mitigation strategy is to prevent fires by prohibiting burning of waste and other material. The project is also coordinating with MINAET to have an emergency plan in case of fire and a fire station close to the area of the project (although this seems better placed in the municipality). The project does not mention whether there is adequate preparation for any other hazards.
SOCIAL a) Basic and Emergency services b) Other Social c) Economy			<u>Emergency Services</u> : The risk of the project saturating emergency services is not deemed significant, which is hard to believe for a hotel that will add more than 1,400 people. There is a tradeoff made in this section, which is to choose to ignore high risk/low probability events. The project does note that the hotel could affect medical services such as ambulances, and also firefighter services. <u>Social Impact</u> : The project deems that the social impact is not significant, although the D1 notes that the “presence of construction workers in the region could induce prostitution and drug consumption.” The mitigation measure of coordinating with the police so that they monitor the situation is not sufficient. There could be more emphasis on prevention. <u>Economy</u> : The PGA notes that “...acquisition of inputs from towns in the region will contribute to the dynamism of the region.” But there is no specific discussion on which products the hotel would buy from the region.

Source: author produced table based on information from the project file (SETENA).

Appendix 4 – Main Points from Marina Pez Vela’s Environmental Impact Assessment

Location: Quepos District. Municipality of Aguirre, Puntarenas Province (Central Pacific Region)

Table A.4. Discussion of Main Environmental Impacts and Mitigation Measures (D1 and EIA documents, Marina Pez Vela).²

RESOURCE CONSUMPTION	NOTES/ANALYSIS & MITIGATION MEASURES
WATER (Local Aqueduct)	<u>Water consumption</u> : The change in design resulted in an increase from 3 l/s to 7 l/s for the first phase of the project, to be provided by the local aqueduct, representing more than doubling of water consumption. The project did not conduct studies to back the aqueduct’s capacity to sustain this increase, and no mitigation measures are provided. The project expects consumption of 9 l/s at completion, vs. 7 l/s at completion originally planned for.
LAND USE	Land Use Plan for Aguirre (<i>Plan Regulador</i>)
ENERGY (From Fossil Fuels)	<u>Energy consumption</u> went up to 2.5 at initial operation state and 4.5 at the end of the project. This seems like a significant increase, but there is no discussion of where the energy is coming from, and the impacts of the increase. No mitigation measures provided.
FAUNA a) Impact: effects on marine biota inside the area of the marina. b) Increase diversity of marine organisms c) Potential increase in fishing	b) The project will constantly monitor diversity of marine organisms (project allocated \$5,000 per year). c) The project will monitor species population, and will design specific areas for fishing by the municipality so that locals can continue with this practice.
FLORA	
INFRASTRUCTURE	<u>Buildings</u> : The changes (submitted after the approved EIA) substantially increased the square meters dedicated to buildings (1710m ² to 8220m ²), but there is no discussion of the impacts (e.g. increase in impervious cover) and no mitigation measures are provided.
IMPACT	NOTES/ANALYSIS
AIR a) emissions from mobile sources b) noise and vibrations Noise from Machinery, from trucks carrying material (C) Noise from boats. Noise from dredging (O)	b) Project will follow national noise regulations, and work will only be done during the day [<i>note: the developer was approved on 2005 permit to work at night</i>] Project will ask building contractors to have machinery in perfect state and to have a maintenance plan. Trucks carrying material will follow same mitigation measures as above, and project will also monitor and follow up with people in the area. Constant monitoring and follow regulations (O)
WATER a) Underground Runoff b) Ordinary Residual Waters:	<u>Wastewater (C)</u> : The developer notes that wastewater from construction will be handled by using portable or blind well latrines, and that maintenance will be given by the firms that carry these products. (If handled incorrectly, these have a high probability of contamination, but there are no mitigation

² The EIA methodology to evaluate impacts comes from SETENA’s Manual of Technical Instruments to Evaluate Environmental Impact (*Manual de Instrumentos Técnicos para el Proceso de Evaluación de Impacto Ambiental*). Note that the valuation system is different from the one issued in the D1 form.

<p>c) Special Residual Waters Dredging: ocean contamination from fuels, oils, etc. (O)</p>	<p>measures provided). <u>Wastewater treatment (O)</u>: the total volume to treat is estimated to be 250m³. Independent systems for the marina and the so called American Zone. The Plant will have a capacity of 300m³. The plants will be aerobic with activated mud. The project has allocated \$300,000 for this. Note that there is no discussion on the energy consumption that this treatment would entail (unless included in the item regarding pumping of the discharge (“<i>bombeo del efluente</i>”). <u>Dredging</u>: In case of storms or high waves, there will be no dredging performed <u>Stormwater</u>: There is a rainwater outlet in the north breakwater and another in the south.</p>
<p>SOILS a) Ordinary Solid residues (waste) Potential contamination b) Special solid residue c) Debris d) Movement of Soil Modification of fluvial and marine sedimentation processes in the mouth of the Boca Vieja Estuary (O)</p> <p>BREAKWATERS d.1) Possible changes in beach because of breakwaters and material, especially during high wave events. d.2) Potential contamination and sedimentation of rivers where rocks and material would be extracted.</p>	<p>a) Ensure adequate sorting and final disposal. Coordinate with municipality for collection and transfer to an adequate disposal site. Implement a recycling program in conjunction with local association. (Allocated \$5000 per year) b) Classify and recycle all the solid waste (steel, aluminum) from construction of the cofferdams and the steel. d) Implement environmental programs to promote reforestation and environmental education in the watershed where material will be extracted (allocated \$10,000) d) Will not deposit dredged sand in forested areas, or with slope more than 40%, or susceptible to landslides, or covered by water bodies. (Allocated \$500) <u>Boca Vieja Estuary</u>. The Estuary is important for the local fishing community. Project will monitor impact on currents and aquatic habitat. Will use info from NOAA and BUOYWEATHER. The project will also conduct a topographic analysis to guarantee navigability of the Boca Vieja Estuary. <u>Breakwaters</u>: The breakwaters almost doubled from the specifications in the EIA. The use of cofferdams allows to decrease the use of extractive material from rivers. The north breakwater is 737 m long and the south breakwater is 219 m long. There are 16 cofferdams of 18.6 meters in diameter constructed in the north breakwater, and 9 cells of 12.2 m in the south breakwater. There will also be dikes, including an internal dike of 110,000 m³. Thirty-four thousand tons of steel were required for the steel cells and 70,000 m³ of sand were dredged for the filling. <u>Number and size of boats</u>: When changes were made to the marina, the number of slips more than doubled from 98 to 192, and the size of boats able to come to the marina increased from a maximum of 35 feet to a maximum of 150 feet. There is no discussion of impact.</p>
<p>HUMAN a) Employment b) cultural and landscape b.1) Improvements to the seafront</p>	<p>a) So that locals can acquire the relevant skills, the project will provide a training program in conjunction with the National Learning Institute (INA). Project will recommend contracting people from this program, and priority will be given to them. (EIA notes in pp. 269). b) Improve quality of the beach: create place where population can take advantage of seafront, develop a program for the collection of waste in the beach (\$10,000 allocated for restructuring of seafront). Beautification plan that integrates marina and seafront, lighting for security, and native plants. The project is expected to have a positive impact on the area of the beach accessible by the community, such as by restructuring the seafront and “improving the quality” of the beach.</p>
<p>OTHER RISK</p>	<p>a) There will be security measures in all machinery dealing with fuel. Adequate maintenance will be</p>

<p>a) Fossil Fuels Fuel: small, medium, to large spills Potential pollution from large spills (impact on water)</p> <p>b) agrochemicals c) dangerous substances Potential contamination of water from fluids in boats Potential contamination of water from waste water from boats Potential contamination of soil and water table by heavy metals, pesticides, oils, hydrocarbons, etc. Potential contamination of water from oils</p> <p>d) uncontrollable burns Potential contamination of water from soaps used to clean boats</p> <p>Other: Breakwaters: possible displacement of rocks in the shell</p>	<p>given to the gas pumps and tanks. There will be a written protocol for the attention of spills, in an area visible to all workers. Areas where machinery is supplied of fuel will be clearly marked. Water quality in the area of the marina will be monitored (chemical analysis) an included in operation costs of the marina.</p> <p>The project has allocated \$300 per month during construction to monitor liquid residue. It will invest \$1,000 per year for the drop-to-drop trap; \$60,000 for security equipment, \$5,000 investment in equipment, \$2,000 in case of spill (medium); same for large. DAILY monitoring.</p> <p>Every gas pump will have an absorbing box to use in case of spill; automatic closing valves, tanks have double lining, protocol, etc. Also better facilities to avoid spills from boats. Fluids: Will have facilities to safely remove these liquids from boats and will be give for free so boats use this system (wastewater service will be given for free). Special tanks to store burnet oils. Marina guarantees safe disposal of these. Soaps: Cleaning of boats will be promoted in maintenance area vs. in the slip area. If done in slips, should use biodegradable products. Oils: There will be traps, and facilities to extract oils from boats to avoid spill to sea Breakwaters: design takes into account high tides and bad weather. The Marina will monitor conditions to detect dangerous situations. Maintenance will be provided to avoid structural problems.</p>
<p>SOCIAL</p> <p>a) Basic and Emergency services b) Other Social b.1) Fishermen b.2) Exacerbation of drug and prostitution problems in the area c) Economy</p>	<p>a) The project has allocated \$10,000 to safeguard the occupational health, rights, and duties of workers on the project. The project will invest in security measures, supplies, training, and coordination with authorities for plan and preparedness in case of emergency. b.1) Fishermen: Floating pier to make available services of fuel, ice, merchandise delivery, and potable water to local fishermen. The project wants to comply with expectations of the fishermen and support their economic activity. b.2) The mitigation measure provided of reporting to the police if there is any inappropriate behavior in any boat seems insufficient. c) Economic: Access and availability of jobs for locals (\$20,000, C) develop a capacity-building program and to incentivize purchases in the local area.</p>

Source: author produced table based on information from the project file (SETENA).

Appendix 5 – Main Points from Vista Perfecta Phase II Apartments’ D1 Form

Location: Playas del Coco, Sardinal District. Municipality of Carrillo, Guanacaste Province (Chorotega Region)

Table A.5. Discussion of Main Environmental Impacts and Mitigation Measures (D1, Vista Perfecta Phase II).

RESOURCE CONSUMPTION	VALUE (1-5, 5 being the highest)	MULT. FACTOR	NOTES/ANALYSIS
WATER (Aqueduct)	3: Water from existing public aqueduct. Consumption between 50 and 200m ³ per month	3	The developer notes that the following measures will help reduce water consumption from the public aqueduct by 30%: rainwater will be collected and stored in a tank to be utilized to water the gardens; water from the wastewater treatment plan will also be used to water gardens; and pool water will be managed so as to maximize utility. The project signed an agreement with Coco Water S.A. for water provision and agreed to make a financial contribution to the construction of the Coco-Ocotal Aqueduct. During the valuation of the change in scope submitted by the project, it is said that there would be no increase in the environmental load for the system of ordinary residual waters. At the same time, it is noted that there will be a 20% increase in water demand, which seems contradictory. At another point the project notes that the increase in scope would represent a 7% increase in water consumption.
LAND USE	1: No modification	3	It does not seem adequate to say that there is no modification in the land use. If looked at cumulatively, it can be argued that the real estate projects are changing the land use in the area, from predominantly rural and agricultural, to urban/suburban touristic areas. As for the project itself though, the municipality gave the project the corresponding permit through the certificate of land use. The developer notes that it will comply with the temporary proposal for land use planning in Carrillo. The developer notes compliance with the Ministry of Housing (INVU) standards and presents letters from the local utilities (water, energy, waste, etc.) backing their claim that the project will provide basic services.
ENERGY (From Fossil Fuels)	3: External supply, more than 240 Mwh/year but less than 1200 consumed	2	The project will work on 1) electricity consumption savings in the operation of machinery for construction, including managing hours of operation, 2) fluorescent lights, and 3) design of lighting of green spaces so to minimize impact on fauna (e.g. by having movement detectors). Energy will be provided by Coopeguanacaste R.L., but there is no discussion of what the impact from this increased consumption is. Energy consumption is expected to increase by 12% with the change in project scope.
FAUNA* ³	1: No effect	2	Only native species will be used.
FLORA*	1: No effect, times 2	2	Only native species will be used.

³ There is a discrepancy throughout the D1 values for certain total values of the different impact categories (market with *). If multiplying the values times the multiplication factors shown, the total value for those categories should be 2, but is shown as 4. The effect on the total score is negligible though.

INFRASTRUCTURE			
IMPACT	VALUE	MULT. FACTOR	COMMENTS
AIR a) emissions from mobile sources b) noise and vibrations	a) 4 b) 3: make noise or vibrations, but within regulation limits, and can be contained.		Require operators of machinery and trucks carrying material to comply with regulations and give adequate maintenance to the machinery. Recommend machinery that use hydraulic force and silencers.
WATER a) Surface runoff b) Ordinary Residual Waters* ⁴ c) Special Residual Waters	a) 3: Increase in net flow is greater than 25% but less than 50%. b) 1: Will use treatment plant (no mention of discharge levels) c) none	2 2	a) Good to see SETENA asking about imperviousness in terms of aquifer recharge, but need to expand the analysis to runoff. b) The project will have a wastewater treatment plant. There is no discussion of the discharge though, and SETENA makes no comments on this issue.
SOILS a) Ordinary Solid residues b) Special solid residue: c) Debris: d) Movement of Soil e) Slope f) density of population g) density of construction h) traffic flow	a) 3: Will classify waste to recover, reutilize, and recycle. Final disposal is a landfill b) 3: Same as above. Final disposal is a "specialized landfill" c) 3: Must transport debris, but in quantity no larger than 100m ³ d) 3: Expect moment of soil and transfer outside of AP in volume of up to 1000m ³ e) 2: Between 15 and 30% f) 1: Expected density of less than 50 persons per hectare. g) 4: Construction coverage greater than 50% but less than 70%. h) 1: New traffic generation	3 3 3 3 3 2 3 3 2 3	a) Waste is expected to increase by 15%. The mitigation measure proposed is separating the additional waste. The annex of mitigation measures fails to account for the real issue of the lack of capacity in the municipal landfill. b) The project notes that special residues from construction (empty jars of paint, remaining iron bars, etc.) will be separated from ordinary waste, and will be transported to the municipal land fill or other area authorized by the municipality. Until their transport, they will be stored in a warehouse in conditions that do not permit infiltration into the subsoil. c) Debris such as rebar, wires, etc. will be separated to be utilized on other phases of the project. Other debris will be taken to the municipal designated area for these purposes. d) Movements of soil (1,000m ³): these will be covered with canvas to prevent generating dust. This soil will be used as much as possible in other areas of the project for the preparation of the terrain. Its transportation out of the area of the project may be required. Elimination of vegetative cover will be strictly for the project area only. [Note that movement of soils had already been done when the project started processing the environmental viability with SETENA] f) Density of population: The project expects a density of less than 50 persons per hectare. This receives a value of 1. This seems like a low estimate, since in high capacity one can expect at least 4 persons per apartment, times 18 apartment, for a total of 74 people, in an area less than a hectare. SETENA's thresholds for population density are not very helpful, and they do not allow for discussion of cumulative impacts (there might be several similar

⁴ Note that a treatment plant gets a value of 1, while a septic tank for example would get value of 5, and sewer system a value of 3.

	is less than 25% of the installed capacity,		developments in close proximity). g) Density of construction: The developer notes that the project's density is 69.59%, although this figure is not adjusted in the documents after an additional apartment is added to the project. (Other parts of the project file note a density of 47%. This might be because these figures depend on whether all the property is taken into account, or only the construction footprint). Footprint is almost 70% of the property. The law permits 75%
HUMAN a) employment generation b) migration c) cultural*	a) 4: Will generate less than 25 new jobs. b) none c) 1: Cultural heritage: The project does not affect scientific, architectonic, archeological patrimony/heritage.	2 2	a) Job generation: 25 persons (operation) for security, cleaning, gardening, etc. The project notes that priority will be given to locals. The threshold levels in the SETENA could be further divided to get more details. How many jobs would be local? How many would be indirect jobs?
LANDSCAPE	3: Countryside/landscape: Infrastructure is being developed in a rural area and does not cause disequilibrium in the existing countryside.	3	Very subjective, it can be argued that the area is undergoing a substantial transformation that, although not a priori wrong, needs to be acknowledged and planned for.
OTHER RISK a) Fossil Fuel Management*	1: Consumes, manages, or stores quantity less than 5,000 liters per month.	2	There is no adequate discussion regarding the fault running through the property, as per the map shown in the technical studies.

Source: author produced table based on information from the project file (SETENA).