

LEARNING TO STAY: A CASE STUDY ON AGROFORESTRY EDUCATION FOR
THE SUSTAINABILITY OF RURAL YOUTH IN
DARIÉN, REPUBLIC OF PANAMA

by

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ABSTRACT

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Adviser: Professor Joel Spring

Attending and completing upper secondary school in Darién, located on the eastern side of Panama, presents several challenges for students: (1) lack of access to upper secondary schools, caused by geographic and socioeconomic factors; (2) poor regional education policies; and (3) adequate infrastructure (e.g. transportation and potable water) that supports consistent school attendance.

The purpose of this dissertation was to learn about an alternative solution to the educational problems in Darién, offered by *Colegio Agroforestal de Darién*, a boarding school. The research question that guided this study was: *in what ways does a school with an agroforestry curriculum contribute to the sustainable development of the youth in Darién?* Sustainable development here refers to the prospects for students to improve their socioeconomic conditions as a result of their technical education, while acquiring competencies to support the preservation of their ecosystem (UNESCO, n.d.).

Darién is the most sparsely populated region of the country—3.7 inhabitants per square kilometer—and the region with the highest rate of extreme poverty; Darién accounts for 52.7% of the national poverty rate (*Contraloría General*, 2008). It is also home to a diverse population; 23% Afro-Latino, 30% Indigenous and 47% Colono-Latino (IADB, 2002).

Using a mixed methods approach informed by rural development and place-based education (Gruenewald, 2003) conceptual frameworks, the study focused on data from the 2007, 2008 and 2009 graduates and from the 2010 current students.

Findings in this study revealed that graduates assessed their training in agroforestry — agriculture, animal husbandry, forestry and land management—as significant in preparing them for employment and motivated many to pursue tertiary education. However, limitations to the continued accomplishments of the school were also found.

This study adds to the body of literature that links the practice of agroforestry systems in developing countries with poverty reduction (Garrity, 2004). Moreover, there is a paucity of empirical qualitative literature that speaks to the contribution of education, particularly in rural places, in the livelihood of youth in Panama.

Keywords: Darién, Panama rural education, Agroforestry education, rural sustainable livelihood, place-based education, rural development.

Dedication

To my family, who has always supported one another through the best of times and through the most challenging times. Throughout this task, your encouragement, support, and most of all your love, have helped me to achieve my goal.

To my friend, redeemer and Lord, Jesus Christ for his continued love and grace.

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CHAPTER 1 – INTRODUCTION

“If the Panamanian school system is to be effective for the greater bulk of rural population, its methods must be revised to meet the daily needs of the farmers...education should fit children to live successfully in the environment to which their birth has destined them.”

Ofelia Hooper, 1944 - *The Plight of Education in Rural Panama*

In 2006 a National Council on Education (CONACED) in Panama was convened by the then president of Panama, Martin Torrijos, to determine the state of affairs of the education system. Their findings revealed several critical concerns in the education system that impacts the sustainable futures of the youths of Panama. One of the most salient findings addressed in CONACED’s report was the need for quality and equity in educational opportunities, a result of a) lack of attention to schools and students in poor regions, b) deficiency in addressing the needs of bilingual and/or intercultural indigenous people and c) limited accessibility to and opportunity for poor students to attend pre-school and secondary schools (CONACED, 2006).

One of the regions of Panama that is gravely affected by the aforementioned educational challenge is Darién, a rural region, located on the eastern side of the country, bordering with Colombia. The province of Darién is most affected by educational inequality and extreme poverty; it has one of the highest illiteracy rates in the country, 20.5%, second to the indigenous communities which average 36.6% (*Estadísticas Educativas, 2009*). Hence, attending and/or completing upper secondary school in Darién presents several challenges for the youth; these are largely attributed to: 1) lack of access to upper secondary schools, caused by geographic and socioeconomic factors; 2) poor regional education policies; and 3) inadequate infrastructure (e.g. transportation, potable water and electricity) that supports inconsistent school attendance.

Darién's National Park with a rich and diverse tropical forest was named by UNESCO as a World Heritage Site in 1981 and as a Biosphere Reserve in 1983; 70% of Panama's protected areas are in the region of Darién. However, it is the most sparsely populated region of the country—3.8 inhabitants per square kilometre—and the region with the highest rate of extreme poverty; Darién accounts for 52.7% of the national poverty rate (*Contraloría General*, 2008). It is also home to a diverse population — 23% Afro-Latino, 30% Indigenous and 47% Colono-Latino (IADB, 2002), with differing social and cultural needs.

Purpose of the Study

The purpose of this dissertation is to learn about one alternative solution to the educational problems in Darién offered by *Colegio Agroforestal de Darién* (CAFD), a non-governmental technical education boarding school, nested in the rainforest of Darién. CAFD's aim is to provide the young people of Darién with a curriculum that 1) connects with the realities of the region and the youth's everyday experiences; 2) provides the youth with the knowledge, skills and responsiveness to take action on issues relating to the preservation of Darién's natural resources; and 3) provides competencies in farming, forestry, livestock, land use management and environmental preservation.

These fields of study are germane to the labour industry in Darién and provide the students with better opportunities to enter the world-of-work. It also helps them develop their own ventures and/or continue their education into a tertiary institution.

In this study my objective was to learn about, and interpret, the educational paradigm undertaken by CAFD, particularly from the perspectives of CAFD former students. As such, the research question that underpins this case study is:

In what ways does a school with an agroforestry curriculum contribute to the sustainable development of youths in rural Darién?

Sustainable Development

The concept of sustainability combines three elements or dimensions—social progress, economic growth and ecological protection (Adams, 2006); synergistically aligned, these dimensions of sustainable development are intended to meet the needs of present generations without limiting the opportunities of future generations to meet their own needs (UNESCO, n.d.). According to UNESCO (n.d.) in an education for sustainable development—which is what CAFD posits—culture acts as the fundamental dimension since the local context and sustainability may take different forms around the world. Therefore, sustainable development for my study refers to the prospects for the youth of Darién to improve their social and economic conditions as a result of their technical education training, while acquiring competencies that support the preservation of their natural environment.

Agroforestry

Agroforestry is largely characterized as a land system that deliberately grows woody perennials in the same land as annual crops or animals, either sequentially or simultaneously (Fischer and Vasseur, 2000). Fischer and Vasseur (2000) state that one of the main benefits of using this method is that it not only increases, but broadens the agricultural production, which improves the standard of living of rural farmers, and

sustains natural resources—soil and water—necessary for continuous agricultural production.

My research confirms that CAFD has contributed to their students' socio-economic growth, while instilling in them a sense of responsibility [embraced by many of the participants] to preserve their rich ecosystem. This assertion is supported by the findings described in this study. However, limitations to the continued accomplishments of the school are also addressed herein.

Theoretical Framework

This study was informed using place-based education and rural development as the lenses in situating the contextualization of the curriculum as a factor that mediate competencies, leading to employment and/or the pursuit of tertiary education; and the increase in environmental preservation consciousness for youth in rural areas such as Darién.

Place-based education as a theoretical frame facilitates the understanding of the relationship between a school's curriculum and its significance to the context or the place where the school is located. Place-based education is not necessarily a new concept; terms such as experiential, learning, project-based learning, place-conscious pedagogy, integrated curriculum, service learning, hands-on, context-based or outdoor learning, are all considered forms of place-based education (Gruenewald, 2003). While place-based education as a learning method can be applied in any environment, that is urban, suburban or rural, scholars in the field of rural education have argued that the education in rural regions needs to be place-based.

The idea of place-based education offers a variety of perspectives that allow school faculty and staff, students and their families to think of their schools and environment as “places that are *profoundly pedagogical...*” (Gruenewald, 2003, p. 621); that is, places where learning occur. This concept is based on the belief that places and culture are synergistically related.

Rural development is associated with measures employed to improving the conditions of people living in rural areas through increased of resources such as access to education, health, infrastructure, and capacity building for agriculture and non-farming occupations (Richards, 2004). One of the major characteristics of rural people around the world and certainly in Latin America is their dependence on farming as a major form of livelihood. This dependence on farming requires accessibility to capital assets, such as natural, human, social, financial and physical capital. However, productivity seems to lessen when access to one or more of these assets are not available. This low productivity of small farmers is associated with lack of access to education, land, water, and technology, amongst other issues (Richards, 2004).

Alcázar, Rendón and Wachtenheim (2002) point out that scarcity of schools, along with lack of teachers, school supplies and poor infrastructure are some of the reasons that rural adolescents, as a whole, do not attend school. Richards (2004) suggests that one way of improving small farmers’ ability to increase productivity and gain access to more capital assets is by creating market linkages—diversification of agriculture—through private-public partnerships. However, to participate in these linkages, education and training is necessary and as stated by Richards (2004):

...concerns about the employability of the rural poor in more knowledge-intensive agriculture [emerges]...Hence the question: *Can education and skills training make them employable?* (emphasis added) (p. 17).

The findings of this study reveal that skills training do make rural people, particularly the youth, employable. However, limitations to acquiring more knowledge and more intensive training were encountered and are discussed herein.

In summary, it is important to use a place-based framework that considers the needs of people in rural areas when developing and researching educational initiatives that focus on improving the quality of life of rural communities. A place-based education framework coupled with rural development objectives of improving rural livelihood enables me to situate education for socioeconomic and environmental development as tools to build the capacity of youth in rural communities. This affords a sense of agency in rural youths' own sustainable development by increasing human capital while leveraging both the social and natural capital of a community. A more extensive body of literature that supports the conceptual framework of my dissertation is available in the Literature Review which is found in Appendix A.

Significance of this Study

For rural development to occur, education must be one of the principal elements to effect change in a community. According to a report by Hosny El-Lakany (2004), of the Food and Agriculture Organization, the prospects of enhancing rural livelihood through agroforestry is significant, mostly because it provides smallholders with many options to farm production in ways that also preserve the environment.

Anchoarena and Gasperini (2006) note that globalization has the potential of destabilizing opportunities for rural livelihood to improve, if rural residents do not have the education to understand and participate in the evolving global economies. They state: “The current situation and trends connected with globalization and the changing rural environment calls for new responses” (p.28). More educational opportunities for rural people can be one of the new responses. Anchoarena and Gasperini assert that:

education and training are two of the most powerful weapons in the fight against rural poverty and for rural development. Unfortunately, these are also among the most neglected aspects of rural development interventions by national governments and by donors (p.29).

This statement confirms the findings in CONACED’s report which provides evidence as to the importance of conducting this study in a rural community, marginalized by extreme poverty and inequitable educational opportunities.

Finally, in Panama there is a paucity of literature that speaks to the contribution of education, particularly in rural places, on the sustainable livelihood of young people. Empirical data based on qualitative research can serve as tools to address changes in educational policies that support regional vs. national educational challenges of students in Panama, as clearly expressed in CONACED’s report.

Structure of the Dissertation

This research combines case study and ethnographic approaches in a mixed-method approach that also uses survey research. It uses rich, thick descriptions (Creswell, 1998) which allows for a more naturalistic way to interpret my findings. Ellis

and Bochner (2009) encourage writing the findings of research in ways that are “evocative, engaging, and personally meaningful” (p.761). I have chosen to do so; hence, my dissertation is articulated through short stories and personal narratives of participants’ experiences and of my experiences, while drawing inference to the relevance of the culture and context in which I ground my study.

Chapter One: Introduction to the Study – It describes the problem and purpose of my dissertation along with the overarching research question and the significance of the study; it presents a brief contextual background of the research site. Finally, it introduces the conceptual frameworks that guide this study and the structure that I have adopted to present the findings of my dissertation.

Chapter Two: Methodology and Research Design - I discuss the specific methodology used for this study. I explain both my quantitative and qualitative data collection process and how they were analyzed. This chapter also explains my philosophical assumptions and offers a reflexive stance on my experience as a native of Panama doing field research with a perceived insider/outsider perspective.

Chapter Three: Context of the Study – Provides a description of the region where the study was conducted as well as the context of the school’s setting, its curriculum, students and other related components of the case study.

Chapter Four: Findings and Analysis - I describe mainly the salient issues participants raised during the data collection process. The findings are organized based on four emerging themes that developed out of the data collected.

Chapter Five: Discussions, Recommendations and Implications – Summary of the salient findings are discussed in this chapter along with the limitations and recommendations provided. This chapter also makes connections with the literature review and the implications for future research practice.

CHAPTER 2 - METHODOLOGY

Experiencing the Rainforest of Panama through Data Collection

In this chapter I begin by providing a personal narrative of my first day of data collection to shed light on the context and site of my research. I then describe the research strategy used—a qualitative mixed method study that combined case study, ethnography and survey research—to conduct, collect and analyze data during my field research at *Colegio Agroforestal de Darién*. I then provide the rationale for selecting place-based education and rural development as my frameworks as well as the reason for the philosophical standpoint used to establish my relationship with the participants of my study. Embedded in the technical descriptions of the methods used for the study, I weave in another account on sociocultural concerns experienced in the process of data collection.

Learning by doing: A narrative account of my first day of data collection

On Wednesday, August 4th it was about 9:30AM when I got off the Panama-Darién coaster bus I crossed unto the other side of the road; the smoothly paved asphalt highway was desolate. The lofty forest and the tranquil sound of nature were the only visible signs of life. I began my quarter of a mile trek from the highway to the grounds of *Colegio Agroforestal de Darién* (CAFD) in the community of Canglón.

As I approached the top of the now rocky road, next to the first school building, the tranquil sound of nature was abruptly interrupted and I was taken aback. At least fifteen U.S. military soldiers in fatigue uniform were moving up and around the school premises; a military truck, jeep and a tractor blocked the semi-paved walkway. The loud radio

playing American country music; conversations in English going back and forth; and a stack of bottled water and Gatorade next to a large army cooler, if for a short time, gave an illusion of being in the U.S. There was heavy construction going on. The contingent, I learned were U.S. National Guards assigned at the school to do some humanitarian work that consisted of expanding the cafeteria area by adding a new wing. I learned from a school staff that the guards had been at the school for the past week and were scheduled to be there for another two to three weeks.

As I got closer to the cafeteria, there were pockets of students along the way. I then saw some familiar faces like the school's cook, *Señora* Elodia;¹ subsequently I briefly saw and spoke with the principal of the school, *Profesor* Miranda, who welcomed me and told me that during his regular weekly address, he alerted both staff and students that I would be arriving to conduct the study. However, on that day, even though arrangements with him were made before, and my arrival date confirmed, there was an early dismissal planned for students and they were not scheduled to return until the following week. The principal calmly said that over the next two days, the soldiers would be working on the kitchen roof and since *Señora* Elodia would not be able to cook, and the students needed to eat, it was best to have them come back the following week. I was somewhat disappointed and I am not sure if it showed, but *Profesor* Miranda then said “But you can still go the classrooms to make your presentation; the classes will be dismissed by twelve noon” (8/4/10).

My purpose for this initial two-day trip was to make presentations to the students, explain the study, and to administer to current students an anonymous

¹ All the names contained herein are pseudonyms, including the name of the school. However, details on the context and affiliated institutions/businesses are based on actual data.

survey/questionnaire, which would assist me in collecting demographic and other pertinent research data. I visited several classrooms, but teachers were too busy trying to get in what lesson they could for the day, so it was difficult to say the least, to get some time with them. I was fortunate, however, to get just one of them, the math teacher, to allow me some time, since students, as I recall, were completing a test. He asked the group of 12th graders to stay in the room until all were finished in class. My first official day in the field was not totally lost; I was able to begin my data collection with the survey/questionnaire instrument I designed. After introducing myself and explaining the purpose of my study to this group of students, I administered and collected 23 surveys. Over the following eight weeks, I surveyed the remainder of the classes in the school — one 10th and two 11th grades—and collected a total of 82 current students' questionnaire. I also located 26 of the graduates who also completed the questionnaire instrument.

Research Design

Based on the purpose of my study, I selected a qualitative mixed methodology strategy to analyze, interpret and describe the findings of this research. I utilized both qualitative case study methods and ethnographic inquiry approaches to understand how young people make sense of their surroundings and construct knowledge based on their culture. While case study research and ethnography share common inquiry characteristics, the rationale for combining these approaches in this study is because of their distinct values. A *case study* is an in-depth description and analysis of a bounded system (Merriam, 2009, p.41; Stake, 1995), while ethnography focuses on exploring a culture. Culture is often characterized by values, way of life, and custom, amongst other

traits, that distinguish a group of people (Merriam, 2009). The bounded system which is the school with all its components—its curriculum, culture, staff, students and community— is the object of inquiry.

Robert Yin's (2003) technical definition of a case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context..." (p.13).

There are several types of applications to case studies. Yin's (2004) *descriptive case study* is used to "describe an intervention and the real-life context in which it occurred

(p.15)." The second is Stake's (2004) *intrinsic case study* "undertaken because the researcher wants better understanding of th[e] particular case....it is not undertaken because it primarily illustrates a particular threat or problem, but because in all its particularity and ordinariness, this case in itself is of interest [to the researcher]" (p.4)

The third type is Bassey's (1999) which he labels *story-telling* and *picture-drawing*.

Both categories are applied to educational activities, project or to enlighten theories.

Bassey describes them as follows: "*Story-telling* is predominantly a narrative account of the exploration and analysis of the case, with a strong sense of a time line. *Picture drawing* is predominantly a descriptive account, drawing together the results of the exploration and analysis of the case"(pp. 62-63).

My research on *Colegio Agroforestal de Darién* draws from all three of these applications of case study. As one of my approaches of inquiry, I will be describing the school's curriculum and its contribution to participants' livelihood in the context where it occurs; both participants and my personal narratives are used to draw meaning to the case and to frame the theories.

Ethnography as a methodology allows for a more holistic understanding and analysis of the components of the bounded system within this case study. The components include the school, its students (current and former), the culture, the school's staff, and the region of Darién, which is home to a rich and diverse culture which includes afro, indigenous and Latino people. An ethnographic inquiry approach allows me to holistically investigate the culture and social structures in ways that can be compelling and that elicit reflexive thoughts on my part. According to Ellis and Bochner (2000) "in reflexive ethnographies, the researcher's personal experience becomes important primarily in how it illuminates the culture under study" (p.740).

Ethnography also provides explanation of the socio-cultural relationships that exist within the case as well as how the socio-cultural structures interact and interconnect with each other. For instance, how the students at CAFD interpret their experiences at school and away from school; how they construct and convey their meaning of the surrounding from an insider (emic) perspective and how they view my presence in their environment as an outsider (etic). Ethnography assists in sorting out the finding and later knitting the case in ways that are compelling and significant not only to the researcher, but to the community being studied.

Finally, incorporating survey research as part of the design of this study allowed me to gather quantitative data from participants about characteristics of their lives that otherwise I would not have been able to collect systematically during observations and/or interviews. Hence, the survey aspect of this mixed methods qualitative study is used as an instrument to incorporate and analyze quantitative data using frequency distribution tables that also serves to validate the qualitative data collected. Overall, case study,

ethnography and survey research methodologies allowed me to conduct my research and interact with participants in a natural manner while gaining rich experiences of the context, the site, and the culture.

Philosophical Assumptions

In conducting qualitative research, it is important that the researcher understands their philosophical stance with which they enter the field of research (Cresswell, 1998; Merriam, 2009). I situated my philosophical assumptions within a social constructivist perspective to understand how people make sense of their natural setting. From this perspective, knowledge is socially constructed and "...there is no single, observable reality. Rather, there are multiple realities, or interpretations, of a single event. Researchers do not 'find' knowledge, they construct it" (Merriam, 2009, pp. 8-9).

Adopting a constructivist stance was important for me since I am a native of Panama, who has been living out of the country for many years, and one without any experience of rural and indigenous settings. On the one hand, with an insider perspective, I am able to be reflexive about my earlier education in Panama and the cultural schemas it constructed for me. On the other hand, entering the field with an outsider perspective allowed me to critically analyze the data gathered. However, having access to both stances afforded me the opportunity to adopt an insider/outsider role as needed while in the field.

Why I adopted a constructivist philosophical stance

My interest in rural education peaked in 2007, after I had the opportunity to meet a group from *Colegio Agroforestal de Darién* at an artisanal fair in Panama City. What attracted me to their booth was the banner with the name of the school and the words *Tierra Nueva*; I was intrigued also by the presence of a few Emberá-Wounaan Indigenous women of Darién, in their traditional attire. My interest in the school and in knowing about the students that attended the school was such, that I asked the group leader about the possibility of visiting them; he immediately said that I could travel back with them if I so desired and I did, a few days later.

Meeting and learning about the people of Darién was not only important but transformative for me because, as a native of Panama, the schemes that I developed of Darién and its people during my formative years of schooling in Panama were very misguided. I remember learning that Darién was a jungle not to be reckoned with, that primitive indigenous people lived there. They were primitive because both women and men covered their bodies with tattoos, they walked around with hardly any clothes—women's breast were exposed and men wore only a *tapa rabo* (loincloths), just enough to cover their private parts—and, of course, they lived in the rainforest [as they still do today]. I also had the impression, based on the social stereotypes, that Darién was a dangerous place where strange things happened—plane crashes—and people disappeared. But most of the stereotypes were towards the indigenous people of Darién.

As I think about the 'education' I received in my formative years, it almost seems that we were taught to think about the people of Darién as 'the other people' who were distant; 'the other people' who just happen to be living in Panama, in the most remote

parts of the country but not really belonging to the whole. In retrospect, I realized also that growing up as a Panamanian of West Indians descent, we were also considered at times ‘the other people’ who shared the identification of Panamanian because of birth, but not socially connected to the mainstream culture.

As an educational researcher, reflexivity takes on an important role when you are in the field and when you begin to interpret your findings, as one’s perspective can be biased whether you enter the field as an insider or outsider. Creswell (2007) explains the following concerning the constructivist perspective:

In this worldview, individuals seek understanding of the world in which they live and work. They develop subjective meanings of their experiences....These meanings are varied and multiple, leading the researcher to look for the complexity of views....Often these meanings are negotiated socially and historically. In other words, they are not simply imprinted on individuals but are formed through interaction with others (hence social constructivism) and through historical and cultural norms that operate in individuals’ lives (cited in S. Merriam, 2009, p.9).

Therefore, a constructivist approach allows me to be reflexive about my childhood learning. The schemes embedded in me by the existing microsystems (the school) of the time, guided my thinking and that of a whole generation of young Panamanian who learned from curriculum models that were mostly traditionalist, behaviourist and unfortunately biased in many ways.

From a sociocultural learning perspective, as Slavin (2009) purports, it is only when we adapt our schemes in response to new information that we obtain balance

between our present or former understanding of a learned behaviour and, as a result, new experiences and perspective are gained.

Theoretical Perspective

The analysis of the data was conducted taking into consideration two standpoints. The first looked at the agroforestry curriculum as a place-based-education approach to teaching and learning. This approach involves not only the participation of students and teachers in the school, but also the context of the school and its community members. The second, rural development, serves to situate the issues of rural education and of sustainable development, which directly correlates to my research question: *In what ways does a school with an agroforestry curriculum contribute to the sustainable development of the youth of Darién?* With these perspectives in mind, multiple sources of data collection were employed to carry out a comprehensive interpretive research study.

Meeting the Parents – Collecting Consent Forms

On August 13th I made my second presentation; it was mostly to the parents and some students, during the parent meeting and report cards distribution for the second marking period. The meeting began with opening remarks from the principal of the school. Ninety one students registered for the 2010 academic year and according to the sign-in roster of the meeting, there were 46 parents in attendance, but I counted 50. During my presentation, the parents [but not necessarily the students] seemed receptive and asked questions. The most prevalent question was: *What if my child does not want to participate in the study?* I explained that participation was voluntary and their child had

the right to decline to participate even with a signed parental consent form and that their consent (parent) would be nullified if their child did not assent to participate.

The principal approached the front and continued with his agenda and announced that I will be there for any one-on-one questions after the meeting; however, a parent raised her hand and requested that I read out aloud the consent form. I must admit that I did not think of reading the consent form out loud since I had already read out my presentation script, which I thought covered most, if not all the information on the *Parent Consent Form*. After I read the consent form, more parents began asking questions and/or confirming their understanding about the research.

Once the meeting was officially over and the parents began to approach the front of the room to turn in their signed forms, I realized why the parent made the request to read the consent form; some of the parents had problems with reading and writing, even though they were actively asking questions and participating in the overall meeting. Some parents asked me to write in the name of their child in the space provided on the form, and to print out their name on the signature section. I also observed others asking their child to complete the form. Some had questions about the spelling of their own names and that of their child. In one particular instance a parent could not correct my misspelling of their child's name; in another case a parent knew the first few letters of the name, but not the complete spelling. Other parents straight up said *I cannot sign my name*. I assisted all of them as best as I could. I wrote in their name as they stated it to me.

In the midst of my first challenge in the field, I was not sure how to react to this; all I could think of was: *What would the IRB office say? Would this invalidate my research*

or the parent consent form? Was there an ethical implication with me signing off for them?

These parents were very unabashed about something that perhaps parents in the U.S. would not be so forthright with, particularly if they were meeting someone for the first time. The parents were very open and seemed comfortable speaking with me and asking questions about living in New York.

What was apparent from this occurrence was that it addressed the problem of the lack of access to formal educational opportunities and training of the people of Darién, which was the premise for writing this dissertation. As mentioned in earlier chapters, the illiteracy rate in Darién is approximately 20.5%; the average years of schooling for men is 6.4 and for women it is 6.0, compared to the national levels which is 9.0 and 9.4 years of schooling respectively (*Estadísticas Educativas*, 2009). This phenomenon may also answer my initial difference in the number of attendees (46 vs. 50) that signed in at the meeting referred to above.

I collected 26 parent consent forms, and subsequently 13 of the students (mostly 10th graders) with a parent consent form assented to participate in the interview and/or observation aspects of the study. In addition, references for CAFD's former students were obtained from some parents as well as from students who were at the meeting. One of the parent/guardian that was in attendance was extremely helpful; she offered to arrange for me to meet with two former students who were her family members and lived with her; she gave me her cell number and also offered to take the consent forms to the former students and said I could stop by that Sunday (8/15) in the town of *Yaviza* to speak with the former students.

Another parent after filling out the form told me that he had another son who graduated from CAFD in 2009; he gave me that son's cell number. The school secretary also gave me a hand written list of the students that graduated from 2007 through 2009, which added up to 88.

That same day, I met Dinora Melendez, a 2007 graduate. She was there attending a workshop sponsored by the *Fondo Mundial del Medio Ambiente (WWF)*.² She told me that she was in her 3rd year of college in the technical agroforestry program at the national university extension in Darién just about an hour and a half away from the CAFD. Dinora offered to put me in touch with other graduates who were also at the university. We made arrangements to meet on Sat (8/14) in the afternoon at the university.

After the parent meeting, the principal made arrangements for me to stay at the school. Later that same day, I was able to collect some assent forms from the female students who did not go home and spent the weekend at the school. One of them, Diana, an 11th grader, said that it takes approximately seven hours for her to get home; at least five of these hours are on *piragua*, a motorboat. Diana had not been home since Easter (five months). Interestingly enough, I found out that she has three siblings living abroad; two in the US (Pennsylvania) and one in Japan (US Army). She told me that her father lives in Darién, but her mom lives in Panama City due to an illness which is treated there.

Data Collection

While my official field research began in August, 2010 and concluded on January 14, 2011, preliminary field research was conducted during the summer of 2009, when I visited CAFD and notified the school officials of my interest to conduct a study on the

² World Wildlife Foundation

school. It was then that a letter from the director of the school was obtained approving the study. During that summer, I began to familiarize myself with the school site, its members and the Darién Region. It is important to note that the academic school year in Panama begins in March and ends in December, hence some of my observations and findings during my preliminary field study are included in this dissertation; appropriate references to this fact will be noted when applicable.

Data collected for this research includes two types: (1) data for the research question which consist of former and current students' interviews and questionnaires, as well as observations; and (2) data for background research which mostly consist of school documents (archival materials such as school reports, curriculum, work plans, etc.), and interviews with teachers and school administrators. According to Creswell (1998), data collection is a "series of inter related activities aimed at gathering good information to answer emerging research questions" (p. 110).

In summary, data for this research study was collected for students who graduated between 2007 and 2009, herein referred to as 'former students' and for the 2010 academic year, herein referred to as 'current students'. Twenty-six of the 88 former students or 30% of the three graduating classes completed the survey; and 82 of the 91 current students or 85% completed the survey instrument. A separate instrument was designed for the 2010 12th graders and administered after the graduation ceremony on 1/14/11; fourteen or 56% of the 25 graduates completed this questionnaire. Some 15 former students (60% 2007; 27% 2009; and 13% 2008), and 13 current students (54% 11th grade; 31% 10th grade; and 15% 12th grade) were interviewed, along with (2) teacher and (3) administrators. As a point of note, the names of the participants referred

to herein as well as the school are pseudonyms. However, the details of the context and affiliated institutions/businesses are based on actual data.

Interviews

As noted earlier, this study included of interviews with current and former students, and school staff. Stake (1998), in speaking about the process of gathering data, notes that “[an interview]...for the most part is not to get simple yes and no answers but descriptions of an episode, a linkage, an explanation. Formulating the questions and anticipating probes that evoke good responses is a special art” (p. 65). With this in mind, I designed interview guides to capture how participants constructed their lived realities, experiences and their perspective about the education at CAFD. The interview guide contained general questions for all participants but questions were also customized based on the type of respondent, current student, former student, and teacher, etc. The interviews were conducted using a video/audio recording device, but for the most part they were audio recorded; the format employed for the interviews was semi-structured. According to Merriam (2009, p. 89), semi-structured interviews are characterized by the following:

- Interview guide includes a mix of more and less structured interview questions;
- All questions [are] used flexibly;
- Usually specific data [is] required from all respondents;
- [The] largest part of the interview [is] guided by list of questions or issues to be explored; and
- [There] are no predetermined wording or order.

Merriam (2009) purports that, “this format allows the researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to new ideas on the topic” (p. 90).

I recorded individual and group interviews using an Olympus VN-6200PC Digital Voice Recorder and in few instances I utilized a FLIP Video Recorder or my Apple IPOD. The voice recorded interviews were transcribed using the Olympus DSS Player software, downloaded unto my laptop. Transcription and editing took considerable amount of time; perhaps each interview took about two to three hours to complete depending upon the amount of relevant information the participant provided. A copy of the interview guides are attached as Appendix E of this dissertation.

Questionnaire

As I mentioned earlier, I administered a questionnaire to current and former students. The purpose of the questionnaire was to obtain demographic data which usually would not be available from the school or the education system. However, the survey also served as a way to triangulate other data I collected, as there were questions on the survey that related to the interview questions I asked. The data obtained from the questionnaire were entered into an MS Access database application and later converted into an MS Excel spreadsheet to analyze the data. Excel is “at the low end of statistical tools....[It is] fine for simple descriptive analyses such as frequency distributions and means” (Picciano, 2004, p. 30) which is what this study required. (Please see questionnaire/survey instruments attached as Appendix B, C and D)

Observation

Observation is one of the most common methods of data collection for qualitative research; for case studies, it constitutes one of the key elements during the field research.

Stake (1995) explains that:

During observation the qualitative case study researcher keeps a good record of events to provide a relatively *incontestable description* (original italicized) for further analysis and ultimate reporting. He or she lets the occasion tell its story, the situation, the problem, resolution or irresolution of the problem. Often, it seems there is no story, that is, nothing relating much to the issues, nothing that opens up the depths of the case....Most readers want the straight story, but they also expect researchers to put themselves into the interpretation, finding meanings that others cannot grasp. (p. 62)

Entering the field, I adopted a 'participant observer' role, which allowed me to not only participate in activities within the school and the community but also to interact with the students and staff in ways that were holistic, without necessarily ascribing to their values and goals (Merriam, 2009). Observations, when possible, were recorded at the time that they occurred; however, in most instances, due to specific circumstances relating to time, place and activities, I wrote them up at the end of the day. Electronic write-ups were done using my laptop and stored in a folder called "*Field Reflections/Observation CAFD 2010.*" There, I kept the notes of the experiences of the day(s) I was in the field. I must admit that, as noted by Stake (1995) above, there were days when it seemed that the observations were inconsequential to my research question, and sometimes frustrating, especially when scheduled activities, meetings or classes were

changed without prior notice or students at the school would give me the run-around. Having to reformulate “what’s next” when everything in that setting seemed to be going very slow and too leisurely for my New York fast paced standard was one of the many challenges of my research; particularly since finding a quiet, isolated space to work during school days was limited. However, learning to change gears with much to accomplish bounded by time and place, proves to be an important asset for a field researcher. I recalled during one of those challenging times one of my committee members (Ofelia Garcia) advice at my proposal defense—I am paraphrasing—“when you go into the field have a list of what you have to do always in front of you...have index cards...you can stray away if you are not clear about what needs to be done” (6/14/10). Surely this was a very useful advice, and when those challenging days came, I was able to go to my data collection protocol and engage in other necessary research-oriented activities, including trying to find the right place to sit and update my *Field Reflections/Observation CAFD 2010* file.

Archival Documents

For this study, a number of archival school documents and news articles were reviewed to obtain more specific facts about the school, such as their mission and goals, strategic plan, the curriculum, graduation data, historical background of the region, etc. Most importantly, this type of data was instrumental in obtaining the names and information on students who graduated between 2007 and 2009.

Data Analysis

Yin (2004) has stated: "Data analysis consists of examining, categorizing, tabulating, testing or otherwise recombining both quantitative and qualitative evidence to address the initial propositions of a study" (p.109). Yin (2004) suggested that researchers should have a general analytic strategy in order to guide their decisions during data analysis. One of these analytical strategies is based on the conceptual framework(s) the researcher selects for their study; my study focuses on place-based education and rural development as my theoretical framework. According to Maxwell (2005), the research questions should be developed in ways that lead you to understand what is going on; that is, your research question must be connected to your research goal(s), your conceptual framework and the research paradigm(s) that is already known on your study. Based on this assertion, I understand that the data collected to gain answers to my research question must help me be able to make these connections in order for the data to reveal the particulars of the phenomenon this study seeks to understand.

How the data was analyzed

In order to answer my research question, using the data collected, I developed some basic thematic categories based on the theoretical frameworks that underpin this research and connected them, when applicable, to the recurring patterns that grew out of the data collected, particularly from the interviews transcribed and the students' questionnaires. The data was then coded based on the recurring patterns that emerged from both quantitative and qualitative data. As such, Table 1 provides the codes used to identify a particular recurring topic or pattern of responses encountered. The table also describes

the elements (individual word, phrase or pattern of words in a text) considered for each code.

Table 1: Thematic Codes

CODE	DESCRIPTION
JAE	Students working in or planning for jobs in agroforestry; attribution of CAFD education as the contributor to their improved socioeconomic conditions.
EBD	Education to benefit Darién – this includes statements or data that support students’ views of the importance of Agroforestry education in Darién; and students attending college in Darién.
CE	Civic Engagement – students involvement in the community and/or aware of environmental preservation matters.
SD	Students use of the word sustainable development or implication of the significance of preserving the environment, socioeconomic issues, government/political issues; and students’ definition of S.D.
C	Any mention or action that points to students’ commitment to stay and live in Darién.

The codes were then developed into the four themes listed below to facilitate the analysis and discussion of findings. They include:

- 1) Students gaining competencies that would make them employable in the agroforestry fields – (JAE and EBD) ;
- 2) Students improving their social and economic conditions as a result of attending CAFD - (JAE);
- 3) Students increasing their awareness of and/or civic engagement in environmental concerns of the region - (SD and CE); and
- 4) Students remaining in the Darién region and becoming future agents of change in their communities - (EBD and C).

Table 2, presented at the end of this chapter provides more specific details on the overall data collection instruments and how the analyses were conducted and later allocated into themes.

The data was collected in Spanish as it is the national language of Panama, hence, transcription of interviews were in Spanish. I then made a decision to translate Spanish into English during data analysis. Merriam (2009) states that “there are typically two strategies students employ who interview in another language. One is that a transcript can be prepared in the language and then translated verbatim into English; data analysis is then done in English. The other strategy is to work in the original language, including data analysis, and then translate the findings and supporting evidence into English” (p. 270). I have selected the later, knowing that a ‘back translation’ check can be requested to increase the reliability of the translation.

Validity of the Study

Validity determines if the interpretation, evaluation or description of the data analyzed is correct and does not pose any threats to the integrity of the research (Maxwell, 2005). I visited CAFD about three times over the past two years informally and have developed strong ties with the school and some of their staff. In addition, I am a native of Panama, who grew up there and completed two years of college studies. So, in a way, even though I am not from the province of Darién, I feel that I have gained the status of an insider and as a result, some of my views could be subjective. However, subjectivity in research is not unusual because researcher’s perspectives are based on the way the data collected is analyzed and interpreted, particularly since “the researcher is the

primary instrument for data collection and analysis (Merriam, 2009, P.212). One way of addressing this challenge was to conduct my research with the proper integrity of character required by all researchers in the field.

My initial interest in CAFD was based on my own personal inquisitiveness about the Darién region. However, once I learned about the mission of the school, I realized that my goal in conducting this study had to be significant not only for me as the researcher, but for the school, their students and the community. Knowing this helped me to focus on ways to ensure that issues of validity and reliability were addressed in ways that were trustworthy; one way was to establish mechanisms that allow for triangulation of the data collected, that is, utilizing several methods of data collection to concur on the validity of what is being investigated. For instance, as Merriam (2009) explains: “what someone tells you in an interview can be checked against what you observe on site or what you read about in documents relevant to the phenomenon of interest. You have employed triangulation by using three methods of data collection—interviews, observations, and documents” (p.216).

Rich and thick descriptive narratives of the school site, the context and the findings were employed in this case study. From an ethnographic and a case study perspective, this approach to data collection is crucial in determining the reliability of the case, particularly since it is a system bounded by time and place.

Summary

This chapter discussed how the case study of *Colegio Agroforestal de Darién* was conducted using a mixed research methods approach. It provided rich narratives of my

initial field experiences as a researcher adopting an insider/outsider constructivist perspective, and reflected on aspects of the data collection challenges experiences in the field. The theoretical framework that guided this research is based on place-based education and rural development theories.

To summarize this chapter, Table 2 outlines the thematic categories of the data collected for students graduated between 2007 and 2009 and students attending school in 2010. The table also lists the sources of data collected and the data analysis process.

Table 2: Data Collection and Analysis Protocol

	CASE STUDY PROTOCOL GUIDING CATEGORIES	DATA SOURCES	DATA COLLECTED	DATA ANALYZED
	Students completing secondary education.	School Records	Collected graduation records from school's secretary. <ul style="list-style-type: none"> • Documents for graduating class of 2007, 2008, and 2009 were obtained from a copy of a hand written pad with First and Last name of students with the year graduated next to each name. 	<ul style="list-style-type: none"> - The lists of students were entered into MS Access Database. A total of 88 former students or graduates of CAFD were entered in the system. - 2007 = 35 - 2008 = 26 - 2009 = 27
1	Students gaining competencies that would make them employable in the agroforestry fields <ul style="list-style-type: none"> - Skills-set - Job training - Internships 	Documents Referrals School Staff Students Interviews	<ul style="list-style-type: none"> • School's strategic plan & syllabus of core courses. • Referrals concerning the occupational status of former students were obtained from school staff/teachers and students (former and current). • Former/Current students questionnaire. • Former/Current students Interviews. • Teachers/Staff Interviews. 	<ul style="list-style-type: none"> - School's strategic plan & syllabus of core courses were reviewed to verify the usage of Agroforestry Curriculum. - Follow-up of referrals obtained from informants were verified, when possible, and documented. - 82 current and 26 former students completed the questionnaire instruments. Data collected on questionnaire included demographic data, educational and occupational activities/plans as well as other data. Data was first stored in MS Access then exported into Excel for analysis. - Interviews with 15 former and 12 current students were conducted. Portions of the interview data was compared and/or cross-referenced to the

Table 2: Data Collection and Analysis Protocol

	CASE STUDY PROTOCOL GUIDING CATEGORIES	DATA SOURCES	DATA COLLECTED	DATA ANALYZED
				questionnaire data and documents. Data was also used for triangulation. Data was coded based on themes and patterns encountered in the information collected.
2	<p>Students improving their social and economic conditions.</p> <ul style="list-style-type: none"> - Employment in the field - College attendance - Influence in their communities 	<ul style="list-style-type: none"> - Referrals - Community informants - PSA local radio station - Questionnaire - Interviews 	<ul style="list-style-type: none"> • The secretary and other school staff (teachers) were able to give me the telephone numbers of some of the graduates and/or information on there whereabouts (e.g. college, working location, etc.). • Other current students (2010) were able to also provide information on how to locate former students. • Some interactions with people in the town and in the <i>chiva</i> (commuters' bus). • A Paid Service Announcement was done on the local radio, <i>Voz sin Fronteras</i> (voice without borders) requesting former CAFD students to call and/or stop by the school. • A questionnaires instrument was developed for both current and former students. (See Appendix 	<ul style="list-style-type: none"> - Referral data was verified using the available resources which, for the most part, was either trying to contact students at the cell numbers obtained from informants or by relying on informants and or other contacts to share the need that I had to locate them and inform them about my study. - Names of the organizations organizations/business were obtained through questionnaire and/or interviews. - Analyzed data collected to determine the type of competencies the students received from internships, jobs, organizations/businesses and post secondary institutions. - Analyzed from interview conversations how students complemented their academic knowledge on agroforestry with their traditional knowledge.

Table 2: Data Collection and Analysis Protocol

	CASE STUDY PROTOCOL GUIDING CATEGORIES	DATA SOURCES	DATA COLLECTED	DATA ANALYZED
			<p>B, C, & D).</p> <ul style="list-style-type: none"> • Semi-structured Interviews with current and former students were conducted (See Appendix E). • Semi-structured Interviews with principal and teachers were conducted (See Appendix E). 	
3	<p>Students increasing their awareness of and/or civic engagement in environmental concerns of their region.</p> <ul style="list-style-type: none"> - How they define S.D. - Active/Involvement in the community - Consciousness of and/or involved in environmental issues in community 	<ul style="list-style-type: none"> - School curriculum - Interviews - Questionnaires - Observations 	<ul style="list-style-type: none"> • Lesson plans were reviewed for content concerning environmental issues and/or sustainable development; civic engagement. • Interview questions addressed environmental issue, community involvement as well as probed into finding out students understanding of the phrase “sustainable development.” • Questionnaire asked for students to explain their understanding of sustainable development. • Current students were observed during their field work classes as well as during school and/or community related activities. 	<p>Analyzed data seeking references from students that addresses the following subjects:</p> <ul style="list-style-type: none"> - Students’ well-being - Improved socio-economic status - Caring for the environment - Community involvement - Students as change agents. <p>Students desire to stay in Darién after graduation.</p> <p>Analyzed data seeking patterns or information addressing:</p> <ul style="list-style-type: none"> - students participation in dialogs about environmental and socio-economic issues, <ul style="list-style-type: none"> - levels of outdoor field activities - Interdisciplinary application of lived socio-economic and environmental concerns in the classrooms - if the lessons use place-based pedagogy - if field (outdoor) activities indeed follows sustainable practice.
4	<p>Students remaining in the Darién region and becoming future agents</p>	<ul style="list-style-type: none"> • Referrals • Phone Contact 	<ul style="list-style-type: none"> • Information on whether students were still living in Darién was 	<ul style="list-style-type: none"> - Analysed data to reflect: - Percentage of graduates working in the

Table 2: Data Collection and Analysis Protocol

CASE STUDY PROTOCOL GUIDING CATEGORIES	DATA SOURCES	DATA COLLECTED	DATA ANALYZED
<p>of change in their communities.</p> <ul style="list-style-type: none"> - Currently in Darién - Plans to stay in Darién - Plans to return to Darién 	<ul style="list-style-type: none"> • Interviews • Students questionnaire 	<p>obtained from peers and other informants (teachers, staff, community members)</p> <ul style="list-style-type: none"> • Phone numbers or contact information for former students were obtained from informants 	<p>field of agroforestry.</p> <ul style="list-style-type: none"> - Percentage of graduates still working and living in Darién - Percentage of graduates involved in environmental improvement activities - Percentage of graduates attending higher education in the field of agroforestry and environmental sciences. - Matching patterns of students understanding of the meaning of sustainable development. - If students were not interviewed or easily accessible, phone calls were made and information documented on roster maintained in MS Access database. - Interviews transcribed and matching patterns within themes were sought Evidence that students developed an affinity to sustainable practices (care & respect for the environment. Evidence of students understanding that their well-being and social life is interconnected to protecting and keeping their ecosystem. - When patterns emerged they were recorded for review, analysis and triangulation when applicable.

CHAPTER 3

CONTEXT OF THE STUDY

And then I saw a new earth and a new heaven³...our vision is for Darién to be that **new earth**... that it will be respected, loved... and a place that sustains the new men and women of Darién.

Fundación Tierra Nueva/CAFD

This chapter begins with a vignette describing what a typical day at CAFD is like followed by a section that describes and analyzes the challenges of the region of Darién, which is the context of the study. I continue with the research site, *Colegio Agroforestal de Darién* and provide rich, thick descriptions (Creswell, 1998) of the school's historical background and organizational structures. The chapter then provides demographic data of the study participants, with a breakdown of both current and former students. I end the chapter narrating the challenges of finding the informants for my study.

On a given day at *Colegio Agroforestal de Darién*

On any given weekday, except for Monday mornings, around 5:30AM the movements and conversations in the dorms begin with students getting ready for their daily activities at CAFD. By 6:30AM a bell rings, and boys and girls start to leave their dorms; some wearing khaki pants and tan polo shirts with an emblem of the school and caramel looking work boots. Others are dressed casually with everyday jeans and t-shirts, either work boots or tall black rain rubber boots.

With plates, mugs and utensils in hand, students head to the open-sided school cafeteria; they line up similarly to an assembly line to get their breakfast, which usually

³ This phrase is taken from the Book of Revelation, Chapter 21:1 in the Bible. *Tierra Nueva* means New Earth.

consists of *patacones* (smash green re-fried plantain), corn tortilla (fried corn), *ojalda* (a large flat wide fried dumpling), scrambled eggs, and some kind of porridge or tea/coffee. I step into the cafeteria, the buzz among students is loud; discussions about homework and assignments are the talk of the early morning. Some scurry to their room to finish dressing or to complete an assignment, after borrowing notes from their peers.

Teachers are now part of the cafeteria crowd, arriving for their morning coffee/tea and a taste from the menu. One particular teacher seems to always have something to say to XYZ students. “Hey! (yelling out name of the student)...remember, you need to turn in your work or you need to see me before XYZ time.” To this informal conversation, the student will reply “*Ta’ bien Profe*” (short for it’s ok professor). The teacher then turns to another teacher—or even another student—and will have some “smart” comment to make about the student in question. For this particular teacher, I learned that that was his method of operation. Every morning it would be a different type of conversation, but mostly the same teacher.

At 7:45AM the bell rings again; another group of students—mostly in school uniform—walk up the quarter mile long rocky and sometimes muddy (depending on the severity of rainfall) road to the school. These are the students who live in the vicinity or within an hour distance who commute daily. It is almost 8:00AM when the bell rings the students disperse; the academic school day is at hand; those in uniform head to one of the four classrooms on the school grounds while the others get their tools—mostly machetes, buckets or rakes, grains, etc.—to go either to their field practice course or to do their community service in and around the school’s 714 hectares of rainforest land that surrounds *Colegio Agroforestal de Darién*.

At about 2:40PM, at the end of the school day, students return to their rooms, change into casual gear; the group formations begin and some hangout outside their dorms, others are in the cafeteria, but most are in what I call, the multipurpose room. This room serve as the teachers' lounge, the library, the technology room and any other purpose that it can serve—though it is not much larger than the size of a classroom. Nevertheless, that is where you will find most of the students during their leisure hours. The room has about 15 computers, but not in good conditions; perhaps only six to eight are working at a given time. The school has a satellite dish for students to access the internet. Between 3:00PM and 5:30PM a teacher is assigned to monitor students in the room, mainly because usage of the resources during that time is to engage in school related activities (homework, research, etc.); for the most part, students comply.

About 5:30PM the bell rings; dinner time. They go back to the rooms to retrieve their wares; the assembly lines begin, though some in anticipation were already on line and ready, perhaps those with kitchen duty. Between 6:30-7:00PM groups of students are canvassing the school grounds notifying or eliciting candidates to trek down to the highway to the nearest 'corner store' which in my [poor] estimate is about one and half miles, including the quarter of a mile from the school to the highway...It could be slightly less. At 7:00PM the students await for a teacher to volunteer to open the computer room for students to complete assignments, surf the web for games, or check their email or facebook network (more on this phenomenon in Chapter 4). At 8:55PM the bell rings...All students must be in their rooms by 9:00PM, and like clockwork, the buzzing gradually decreases, and by 10:15PM the restful sound of nature takes over; at times only disrupted by howler monkeys, common to the region.

On any given weekend there will be a few students at the school who did not travel home. The students that are at the school during the weekend are assigned to feed the few farm animals (chickens, pigs) they have. During the rest of the weekend they engage in leisurely activities. I returned one day to the small room I shared with another teacher in the girls' dorm and found students watching a movie on a small TV/DVD. The device, I learned later on is circulated back and forth during the weekend between the boys and girls' dorm, depending on who has the largest collection of DVD's. At times, they would come together and place the 15" TV in the cafeteria for the enjoyment of all.

On Monday mornings, the picture is slightly different from the other weekdays. All the students are in uniform, and by 8:00AM all are required to line-up on the basketball court, which is also the amphitheatre and all around purpose outdoor space. Once they are lined-up, the civic activities begin. First, the oath to the flag; next, the singing of the national anthem; third, a quick rundown of business matters, announcements (e.g. reprimands, upcoming events, etc.); and the final word from the principal, who makes the announcements which is always a word of encouragement and for the 12th graders, a reminder of the need to shape up in anticipation of the approaching end of term for those scheduled for job internships. By 8:25AM, students are dismissed; some go into their classrooms others back to their dorms to change clothes to do field practice and/or community service.

As a point of note, the school does not have maintenance workers, so the students with community service duties are scheduled on a rotation basis to do the required maintenance. While the students are in the cafeteria, on occasions, before all students disperse to their classes, one of the cooks, *Señoras* Elodia or Emelda, will express their

dissatisfaction: “Who was scheduled to work in the kitchen yesterday? The pots were not washed” or “Who was using the kitchen last night, it was left dirty.” The final warning is for students to remember their kitchen duties’ schedule. I was surprised that during my field research, I did not see students involved in the preparation of the meals. In the past, during one of my visits (maybe summer 2009) students were assigned to start the breakfast by preparing the dough for the *ojalda* or peeling the plantains (this they still do) for the *patacones*. During the maize season, the students would harvest the maize they sowed as one of their agroforestry projects; then those with kitchen duties would use the *moledora* (a manual grinder) to prepare the *tortillas* for breakfast. I have participated in these activities with the students (usually with the girls). The grinding requires a lot of arm muscles, something that I really did not have; I was glad that I tried and was not bothered by being the object of amusement by the students. I also observed the preparation of the *ojalda*, a tedious process, particularly since it is been prepared for at least 60 people. The current students seem to have strong predisposition to conducting chores around the school, compared to my observation of the former students.

The Region of Darién

"Darién is an aquarium of the world".⁴
José Yunis, The Nature Conservancy - Colombia

Geographic Factors

Darién is the largest province in the country; however, it is almost 16,280 square kilometers is sparsely occupied, with a population density of only 3.8 inhabitants per square kilometer throughout its 695 communities. *La Palma*, its capital township, is

⁴José Yunis is the Director of the nature Conservancy of Colombia.

separated from all other townships by *Rio Tuira*, one of the main rivers connecting all the townships. Therefore, the major means of transportation into La Palma is by motorboat or canoe; travel from *Puerto Quimba* (the port) to *La Palma* is between half an hour to forty-five minutes. The main government offices, including the regional office of the Ministry of Education is located in *La Palma*. The average travel time into *Puerto Quimba*, from any given township in Darién is between one and two hours. This could be mainly attributed to the terrible conditions of sections of the road that leads to this port.

Almost all schools in Darién, primary and secondary, are listed on the Ministry of Education (MEDUCA) website as “areas of difficult access.” This means that in the absence of bus transportation, students would have to travel to school either walking and/or by canoe/motor boat. Most of the public secondary schools are located between one to three hours away from each other, including the one non-governmental secondary school, *Colegio Agro-Forestal del Darién (CAFD)*, located in the town of *Canglón*, about 40 minutes from *Metetí* where the central bus terminal is located and between 45 minutes to two and half hours from what I call the tri-central townships—*Yaviza*, *Agua Fría* and *Santa Fe*. Therefore, one of the greatest challenges for the youth of Darién who live in one of the 695 communities beyond the tri-central townships and *Metetí* is to get to the most accessible school in their area. As a result, the geographic location of schools, coupled with socioeconomic factors, often determines whether a student attends and completes secondary education or not.

Another issue affecting school attendance is also the lack of teachers’ commitment to teach in Darién. According to one of MEDUCA’s former regional

director of Darién, approximately 90% of the teachers appointed to work in Darién are from other parts of the country. MEDUCA assigns teachers to school sites, and assignments cannot be changed until an opportunity for a permanent or choice school opening is found and/or earned based on seniority. Teachers assigned to work in Darién, who reside in other parts of the country, must invest a minimum 16-hour roundtrip, travelling on public bus transportation. Also, as described in the literature review, there are some risks associated with working in rural and indigenous communities, mainly those dealing with access to the school using the waterways as the main transportation mechanism. Needless to say, many teachers are often not pleased with being assigned to work so far away and as a result, they constantly seek opportunities to leave this province. Consequently, their level of commitment to the assigned school is often minimal and turnover rates are very high. Also, when a teacher does not show up at his/her post, there are no substitute teachers and the students' education is often interrupted until that teacher returns or until another teacher is appointed; of course, it is not an expeditious process.

During my field research at CAFD, three teachers received notice that their transfer request finally came through. Two of the teachers were there for two years; another I believe was there for one year.

Socioeconomic Factors

The U.S. Department of State in 2007 issued a report on human rights practices in Panama; it stated that “children did not always attend school due ... [to] financial and economic constraints, lack of transportation, and *scarcity of secondary schools*. The

problem was most extreme in Darién Province and among indigenous communities (US Dept. of State, 2008).” Not having ease of access to secondary schools limits the opportunities for the youth of Darién to fully participate in and benefit from the sustainable development efforts necessary to not only aspire for a better livelihood, but also preserve their communities and their region. As cited in Spring (2004): “the most widely used definition of sustainable development, as expressed before, focus[es] on the relationship between social development and economic opportunity, on the one hand, and the requirements of the environment on the other...on improving the quality of life for all, *especially of the poor and deprived...*”(p. 113).

While a significant number of the families of the students at CAFD, including the graduates, are landowners, they are still not economically solvent. They live from day-to-day from their resources and require the participation of all family members to maintain their very modest livelihood. Therefore, educating their children is an expensive endeavour for them and represents a sacrifice for the whole family.

Infrastructural Factors

According to a 2003 survey on quality of life, by the Inter-American Development Bank (IADB), at least 43.3% of the people of Darién are living without potable water and limited electricity. The report stated that only 28% of the Darién population is receiving electricity regularly. Over the years, IADB has financed Darién Sustainable Development Programs addressing this concern among others; however, prior to my field research experience in Darién and during my recent stay, I have personally experienced the issue of not having potable water and other lacks that exist

throughout various communities in Darién. During my field research I stayed at a hostel, *Las Nachiras* in *Metetí*. I had to request the one large pail of daily water allowance for the guest. Sometimes, when the flow of water was not steady to fill the large pails, the owners would resort to using the reserved ‘rain water’ they collected in huge containers in the back yard.

The problem of infrastructure in Darién is evidenced in the IADB Sustainable Development Report in which they state that:

the main risk identified for the program is related to the time needed to complete rehabilitation of section V of the highway [from *Canglón* to *Yaviza*] and to install water systems for the communities along the highway. Based on experience to date, in general, neither foreign nor national companies have demonstrated any real interest in bidding on projects in the areas of Darién that are difficult to access. Accordingly, few companies have been participating in the program tenders (IADB, 2007, p. 18).

The report continued to state that they would attempt to start some of the work for the water system “this summer.” That was four years ago and the problem is still relevant. As a point of note, it was out of this IADB Darién sustainable development program that funds were provided for the start-up of *Colegio Agroforestal de Darién* (IADB, 2007).

Currently, as I understand it, in *Metetí* neighbours take turn in getting water on a regular basis. I recall that while in *Metetí* at the home of a teacher, *Consuelo*, as I prepared to leave, she walked me out to the main asphalt road. She suddenly exclaimed, “Oh no! The water guy, I think he is going to shut off the water.”

She called to him,

“Sir, are you going to shut off the water.”

“No.” “O.K., thank you”

(my notes 1/4/11).

She explained that technically he was supposed to reduce the flow of water on her side of the street to allow the neighbours on the other to increase theirs. This process was intended to take place every week. On the other hand, when I interviewed one of the former student, Inez, a 2009 graduate, I asked what she believed was the greatest challenge in Darién. She said:

There are certain areas in Darién where there are limited flow of water, for instance in some neighbourhoods of *Santa Fé* and *Zapayal*, during the fall the water only comes every eight days.

I said, “Do you mean for eight days?” And she reiterated her statement:

No, one day in eight days...every eight days. Where I live, I do not have this problem, but others do. There is a vehicle with a cistern that distributes water to the community.

Another student, Carlos, an 11th grader appears to be very mild-mannered. Yet he demonstrates a strong self-assurance about himself in the interview. He approached the issue of the lack of water from a totally different perspective. Our conversation centered on the need to create a more sustainable Darién. He went on to say:

...there are times when they [the government] do not use our natural resources to our benefit. For instance, very often we do not even have water to drink in the

summer, yet during the carnival [people] are bathing in it. This is *very catastrophic* for Darién (10/5/10).

What Carlos is alluding to here is the fact that during the carnival, the government sponsors vehicles with water cisterns to go around with large hoses sprinkling water on people as part of the celebration.

While I address the civic engagement and concerns for the environment in Chapter 4 as one of the emerging themes, I think it is pertinent to mention here that Inez and Carlos' sentiments expressed herein reflect not only their responsiveness to a key issue that affects the province but also their competence in addressing the issue of sustainable development and their willingness to engage others in finding solutions to this problem.

As a point of note, I asked Inez what is her advice to the students at CAFD. She said: "You must demand to be heard, be disciplined and be conscientious so that when you leave the school, you know how to handle things [well]" (9/27/10). Carlos is the president of, *Asociación de Jóvenes por un mejor Darién* (Youth Association for a Better Darién). These are few examples of students becoming agents of change in their communities, which makes it more important to ensure that education is at the forefront not only for CAFD, but also for MEDUCA.

Environmental Factors

Darién is often referred to as *el pulmón del mundo* (the lung of the world), an essential organism. It is distinguished by its rich and diverse tropical forest; Darién National Park

was named by UNESCO as a World Heritage Site in 1981 and as a Biosphere Reserve in 1983; 70% of Panama's protected areas are in the region of Darién.

A recent Colombian news article describes Darién as a thick forest where one in ten species of the world is found. And as such, this makes the Darién region one of the main places on the planet with greater biodiversity. The article quotes José Yunis, of The Nature Conservancy of Colombia, as saying:

Darién is an aquarium of the world...it rains there about 300 days a year, and these rains deposit the equivalent of 'a four-story building with water' coupled with the amount of light and high humidity, make this place perfect for millions of plants and animals habitat (Pabón Baena, 2010, para. 13).

This article was written in response to the recent concerns about the possibility of opening the *Tapón del Darién*. The Darién Gap is the divide that interrupts road travel through the Americas; that is, from Argentina to Alaska via the Pan-American Highway. Pabón Baena goes on to say that:

...the expert [Yunis] makes it clear that it is not the road that will directly generate the impact on the environment, but the flow generated by having a path close to an international border....A road is like a river, the flow cannot be controlled (2010, para. 14).

Concerns and Impact of the Panama-Colombia Border on Darién and its People

El Tapón del Darién (the Darién Gap), a stretch of 56 miles of dense forest has been a topic of much contention for over 30 years. Renewed polemics on issues of opening the *Tapón del Darién* began in 2010 in Panama. Some stakeholders argue for

increasing global economic trades facilitated by the expected flow resulting from the opening of the borders. Opponents, however focus on social and environmental concerns such as the flow of drug trafficking and guerrilla groups from Colombia [which is currently a problem in Darién] and the dislocation of indigenous people from their land. From an ecological stance, Darién's rich biodiversity will be jeopardized. As noted by CAFD's Foundation director, Ms. Gutierrez,

the FARC⁵ (Colombian guerrilla) are our neighbours and lots of time youth are recruited to be part of these delinquent organizations and we feel that the more youth stay in Darién having the opportunity to study, the less chances are that they are recruited by one of these foreign aggressors (10/7/10).

She also expressed that one of the problem with the youth migrating to the city, is that they end up living in the worse neighbourhoods and may also become part of a gang, "so the more we accept in the school, the less chances that youth will migrate and end up being ...delinquents" (10/7/10).

In addition to the potential impact opening the Darién Gap purports to have on this region and its people, Darién has become the home to a variety of global actors

⁵ The FARC (Colombian Revolutionary Armed Forces) is the main leftist guerrilla force in Colombia. A recent article in the *Latin America News Dispatch*, about a diplomatic cable leak states that: Colombian guerrillas, have incurred on Panama's heavily-forested, southern Darién province....The FARC is not a major concern to Panama and the government traditionally has allowed a "live and let live" policy with the guerrilla group. However, Panama does not have the capability to combat the FARC and the U.S. sees a need to form a "Frontier Force" in the Darién. "There is little political gain in taking on the FARC publicly, and much to be lost. [The]... Government of Panama may fear an aggressive campaign against the FARC could lead to a showdown in the Darién to which the GOP would, with current forces, lose"....Panama is viewed as "a middle income country," which should pay for its own programs; cutting aid hurts the U.S. more than Panama. Due to rises in street crime and pressure from the public to put more money into social programs, if aid were cut the Panamanian government would divert its resource away from fighting drug trafficking. <http://latindispatch.com/2011/07/01/leaked-diplomatic-cable-reveals-u-s-panama-express-rendition-program-hints-at-farc-in-panama-city/>

which include private investors in the forestry field [mostly teak reforestation business], a few in agribusiness, and others in environmental and rural development institutions.

Colegio Agroforestal de Darién – CAFD

Founded in 2004, CAFD is a technical secondary boarding school, serving students in grades 10 through 12, under the auspices of the *Fundación Tierra Nueva* (New Earth Foundation), a non-governmental organization. The initial funding for the school was provided by the Inter-American Development Bank. In addition to the privately funded sources, the school receives in-kind funding from Panama's Ministry of Education by allocating certified teachers and other education related materials. CAFD's mission is

...to create sustainable development mechanisms for the students, their families and their communities and to foster the expansion of human capital in Darién by stimulating an education that leads to an increased interest in the preservation of their rich ecosystem and their communities while improving their socio-economic conditions. (*Fundación Tierra Nueva*, n.d.)

The education students receive at CAFD is to prepare them to immediately enter the world of work; however, the emphasis is for the students to create their own niche by becoming entrepreneurs and/or by continuing on into tertiary education. CAFD's vision is "for Darién to become a renewed land, one that is respected and loved by its people; a land that provides solutions to the grave poverty problem and one that contributes to the growth of a new generation of men and women of Darién" (*Vicariato de Darién*, n.d.).

CAFD is the most centrally located school between the various townships of Darién: 1) it is about 45 minutes by bus from *Metití*, the largest town in the province, and home to the central bus terminal and 2) by bus it is also about one and a half hour from the main seaport, *Puerto Quimba*, that takes you into the capital city of *La Palma* and other townships. The school is focused on preparing students who would graduate and (1) become gainfully employed in the fields of agroforestry; (2) continue into higher education; (3) develop a commitment to preserving the environment; and (4) remain in Darién to become agents of change to teach and develop sustainable environmental practices throughout the communities they represent and the region as a whole.

How the school got started

Monseñor Rómulo Emiliani – A voice in the wilderness for Darién

CAFD was the brainchild of [Monseñor Rómulo Emiliani](#) of the *Vicariato de Darién*; Emiliani is well-known and admired for his role as a zealous grassroots developer for Darién from 1988 until 2002, when he was compelled to relocate to another post due to threats received from the bordering Colombian guerrillas. His dedication, vision and love for the people of Darién are palpable from the excerpts of a public letter he addressed to the new Monsignor for Darién. He wrote:

Attention to the pastoral action in the province [of Darién] and the *Comarcas* must always be in motion. Continuously visiting communities by river, sea, and road.... [Being] with people, sleeping on floors of schools, getting mud-spattered through these paths, going where they are and hearing the cries of our people. Hear how they think and what their aspirations are; promote the

organization of the people maintaining respect for the three ethnic groups in Darién: peasants, blacks and indigenous. Protect the riches of these three groups

Someone once said that I had put the name of the Darién on the Panamanian awareness map. However, the glory is to God. Now, it is up to you to make our *Dariénita* people to be included more and more in the national life, as a province and as a Comarca community like the others are viewed. And in summary, that Jesus Christ is loved and glorified and that our people are lifted up and grow integrally. That is our mission. (*La Prensa*, 2005)

This message conveys not only his caring and commitment to the sustainable development of the people of Darién, but also the extreme needs of this province which persists today.

To ameliorate some of the needs of the province, Emiliani, a native of the province of Colon on the Caribbean side of Panama, upon arriving to Darién in the late 80's and realizing the grave needs of the province, established three prominent programs which are still in existence: *Fundación Proniños de Darién*, which provides transportation and food for young children, particularly those in very removed communities and *comarcas*; *NutriHogar*, a cafeteria where children and youth are provided with breakfast and lunch; and *Cristo Sana*, a group of doctors from around the country who volunteers to come to Darién to treat the locals. *Voz sin Fronteras*, the oldest and most heard radio station was also one of Emiliani's legacy. Monsignor Emiliani is currently commissioned at the Dioceses in Honduras and focuses on trying to find peace amongst the many gangs presently in Honduras.

During my interview with Selma Gutierrez, Chair and Director of *Fundación Tierra Nueva*, she shared the interesting account of how CAFD went from being an idea grown out of a youth rally in 1990, sponsored by the then vicariate of Darién, Monsignor Rómulo Emiliani:

[During the meeting they]...were analyzing what were the strength, opportunities and weaknesses of the youth of Darién, and one of the suggestions of the youth was an agroforestry school with dorms so that they would not have to migrate to the city of Panama and at the same time to study something that was directly related to their environment....We thought that was an excellent way for them to not only continue their education past junior high school level, but also instil in them the need for conservation and sustainability of their region. (10/7/10)

The proposal was followed up and the group of concerned people, headed by Monsignor Emiliani, began the work of making the school a reality. Both the Catholic diocese and community members donated the land for the construction of the school. As curriculum ideas were examined, Gutierrez travelled to *Universidad EARTH* in Costa Rica;⁶ there she received assistance on curriculum development and instruction. It was not until 2005 that they opened the school doors with 50 incoming 10th graders and since the first graduation in 2007, the school has graduated 88 students.

⁶ Universidad EARTH in Costa Rica is a private, international, non-profit university in the field of agricultural sciences. They also conduct research aimed at studying and providing rational alternatives to the use of natural resources. <http://www.earth.ac.cr/en>

How students are admitted into CAFD

According to Federico Miranda, current principal, and a teacher at the school since 2007, the school has a designated admission period which begins in October and ends in December. During this period, only 50 applications are distributed in anticipation of only accepting 30 students for the academic year. However, within the first two weeks of the school session, there is usually a 10-15% drop-out rate. Details as to the causes of drop-out rates are provided later in this chapter. In addition to the application, the prospective student must

- write an essay (1.5 page in length) explaining why they are interested in attending CAFD;
- complete an admission test (usually end of January) which consists of a one week stay at the school and participation in various seminars on, nursery maintenance, livestock, food preparation, basic grains, etc. A day is spent on each activity and the student must complete each session. Students are evaluated based on their conduct and disposition.
- have completed the lower secondary schooling and turn in supporting school, health and citizenship⁷ documents; and
- submit two letters of recommendation from distinguished members of the students' community (doctor, pastor, legislator, teacher etc.) that can attest to their conduct and character.

⁷ There are many students in Darien who are Colombian refugees.

Federico Miranda notes because they can only accept 30 students since the school only has four classrooms some students may not be admitted, even if they pass all of the requirements.

Fees associated with attending CAFD

The admission test requires a \$15 fee which covers the one-week expenses associated with the activities, room and board and didactic materials. If students are admitted, they will have to pay a monthly tuition fee, which, according to Ms. Gutierrez, is a nominal fee. There are two types of students admitted, the in-school and the out-of school students. The in-school students live two or more hours away from the school; these are the students who live in the dorms. The out-of school students live within the immediate surroundings of the school or between one to one and a half hour commute to the school.

All students are expected to pay a tuition fee of \$25 upon starting the school year. Thereafter, the in-schoolers pay a monthly fee which is between \$20 and \$25. If they have government scholarship the fee is \$25, if not then it is \$20. The out-of schoolers pay \$15. Both the principal and the *Tierra Nueva* director insist that these fees are symbolic as they really do not cover the monthly cost per student which is approximately \$175 and is offset by the Foundation. The natural question for me was what would happen if students could not afford the monthly fee, considering that most of them come from homes with limited financial resources. Ms. Gutierrez noted that the intention is not to expel students from the school if they fall short on payment of their monthly fees; rather, the school has creative mechanism for the students to continue their studies.

...We tell them that they can do something else such as tutoring another student if they are a good student or contribute with a chicken, some rice, plantain [from their farms], or something like that. So that they feel that they are contributing and know that it is their school... *Yuca, Ñame*, this [contribution] also helps cover some of the cost of feeding them. Adolescents eat! ...especially since they have been working out in the sun all day (10/7/10).

As covered in the literature review that is Appendix A, families in rural and indigenous communities finance their children's education (Rendón and Wachtenheim, 2002), which has implications for lack of schooling. Since the families at CAFD are no exception and also have to self-finance their children's education, it is encouraging to know that the school's administration has policies [though I am sure unwritten], that consider the families' economic conditions. The data presented on Table 17 in Appendix A points to, *lack of money* as a deterrent for attending secondary school, especially when, as conveyed by Rendon and Wachtenheim (2002) the cost of schooling is prohibiting and at the expense of not having enough hands to labour during the harvest season; therefore, any mechanism to ensure that students attend school is worthy of exploring.

The methods used by CAFD administration are meaningful as they allow the parents and students to preserve their dignity and appreciation for the education they are receiving. It is also interesting to note that while many of these families are land owners with agricultural and cattle farms, what they produce is mostly for their sustenance and in many cases just a small percentage of their production is for sale in the market. Even so, as shared by one of the participants in this study, selling one's produce in the market for economic gain offers many challenges for the farmers.

Affiliations, collaborations and partnerships

Colegio Agroforestal de Darién as expressed earlier was initially funded through the Darién Sustainable Development Program, sponsored by IADB. It subsequently obtained funds from other organizations such as the U.S. Embassy who provided the funds for the cafeteria. Most recently, the school collaborated with the USAID, and the U.S. Southern Command National Guards, to expand the school's cafeteria. The U.S. Embassy also has provided Peace Corp Volunteers to work at the school. During my field research, there was one Corp member, who was there to work with the students on organic farming; many others were spread out throughout the various communities in Darién. I personally met at least three others in *Metetí, Santa Fe* and *Villa Darién*.

Funds for the three daily meals that students receive are obtained through subsidies offered by government agencies as well as some private entities. Other school related activity and didactic funds are based on private donations.

CAFD has also developed an articulation with the Zamorano Agricultural University in Honduras, where a number of their graduates have received full scholarships to study. Surprisingly, they do not have the same type of articulation with Universidad EARTH, in Costa Rica, who assisted them in developing the curriculum for the school.

All schools in Panama—public or private—must be registered through the Ministry of Education (MEDUCA), as such, private schools that do not have enough funds to pay for their own teachers, can request certified teachers from MEDUCA for their schools. This is the case of CAFD; 90% of their teaching staff is MEDUCA appointed teachers and 100% of the administrative staff is paid by the Foundation.

The School's Curriculum

CAFD's curriculum is based on agroforestry systems, which is an interdisciplinary approach to systems of land use. It involves not only the interrelation of forestry and agriculture, but also of livestock and more technologically advanced land usage systems such as aquaculture and fisheries (Journal of Agroforestry Systems, 1982). According to a report by Hosny El-Lakany (2004), of the Food and Agriculture Organization, "[a]groforestry, as a science and practice, has the potential to contribute to the improvement of rural livelihood, due to the capacity of its various forms to offer multiple alternatives and opportunities to smallholders to enhance farm production and income, while protecting the agricultural environment" (El-Lakany, 2004, p.1).

Table 3 below presents, courses students take throughout their three years of schooling at CAFD.⁸ A copy of the lesson plans for the agroforestry related subjects was obtained from the school's secretary.

Table 3: Required CAFD Courses

Agroforestry Academic Subjects	Estimated Number of Hours per Week(*)	General Education Academic Subjects	Estimated Number of Hours per Week
Agroforestry	1.3	Biology	1.3
Agroforestry Technology	1.3	Chemistry	1.3
Administration –	1.3	English	1.3
Fieldwork	7.0	Information Technology	1.3
Livestock Production	1.3	Language Arts	1.3
Livestock Technology	0.4	Mathematics	1.3
Research Project	1.3	Nutrition	0.4
		Physics	1.3
		Social Science	1.3
TOTAL WEEKLY	15.1	TOTAL	12.4
(*) Hours are based on two 40 minutes period per day. Some courses increase to 2.3 hours per week in grades 11 & 12.			

⁸Grid is based on a 2009 schedule of classes obtained from CAFD.

Staff Breakdown

Table 4 below provides a breakdown of the staff at CAFD. As of the time of my field research, the school staff consisted of eight teachers assigned by MEDUCA. Almost all of the teachers are assigned two different subjects to teach.

Table 4: Teachers and Staff at CAFD by Area of Responsibility

Area	# Staff	Funded by
General Education – two teachers teaching two subjects	5	MEDUCA
Specialized teachers, including the principal	3	MEDUCA
Specialized teacher – teaching two courses	1	Tierra Nueva
Principal	1	MEDUCA & Tierra Nueva
Office Secretary	1	Tierra Nueva
School Administrator	1	Tierra Nueva
Field work Assistant/ Forest Maintenance	1	Tierra Nueva
Cafeteria workers	2	Tierra Nueva
TOTAL SCHOOL STAFF	15	

Because teachers are appointed by MEDUCA, the school does not have any control on teacher turnover, which is a regular occurrence at CAFD and at most school located in difficult to access areas. This phenomenon as addressed in the literature review is one of the challenges of rural education. Prior to my completion of the field research, I already learned that two of the general education MEDUCA teachers (Spanish literature, Nutrition, Language arts and technology) and one specialized teacher (agroforestry) were not going to be returning for the 2011 academic year.

Demographics of CAFD's Participants

Based on the analysis of the demographic data for the 26 former students and 82 current students collected from the questionnaire, the gender and ethnic background of the participants is reflected in Table 5 below.

Table 5: Student Diversity

Ethnicity	Current Students	Former Students	Male	Female
Afro-Latino	28%	23%	17%	9%
Colono-Latino	40%	58%	29%	15%
Embera/Wounaan*	16%	15%	10%	5%
Kuna*	5%	0%	3%	0%
Other	11%	4%	5	6%

*Indigenous people

The 26 former students surveyed are dispersed across 17 communities, while the 82 current students surveyed are dispersed across 28 communities of the 695 sparsely populated communities in the province of Darién. Less than 3% of all students surveyed provided information on household income. However, all provided data on household size. The average household size of the former students is 5.6 compared to the household size of 5.9 for current students. On the other hand, 65% of the current students' family earn their living as farmers while 6% are in livestock; 1% in forestry, and 26% earn a living in none agroforestry related fields. The in-schoolers, which are approximately 60% of the total population, either travel home on weekends or every two weeks based on their parents' availability of monies for transportation expenses. On the other hand, there are some students that only go home once during the academic year or

at the end of the school year. As shared before, Diana, one of the 11th graders, did not go home in five months.

Current Students

Gaining access to the students for the 2010 academic year was not difficult as they were contained at CAFD and readily accessible. The teachers gave me the opportunity to make the presentations in their classes. Since the survey instrument did not require students to identify themselves, all of the students in the session completed the form. Those who wanted to participate in the interview completed the consent and/or assent forms. The survey instrument was administered to 82 of the 91 current students enrolled; of these students, 13 were interviewed. The breakdown of the 82 current students in grades 10 through 12 for the academic school year 2010 follows in Table 6:

Table 6: CAFD 2010 Current Students Participating in Study

Grade	Number of students on Roster(*)	Number of students Surveyed	Number of students Interviewed
10	20	19	4
11A	22	22	4
11B	18	18	3
12	25	23	2
Total	85	82	13
(*) The difference in enrolment vs. Those on the roster may be related to the students who dropped out.			

Former Students

Based on referrals received from the community resources, I was able to contact 26 of the 88 former students of the graduating classes of 2007, 2008 and 2009. All 26 students completed the questionnaire instrument and 15 of them participated in the interview process. Table 7 provides a breakdown of the participants by graduation year.

Table 7: Former Students Participating in Study

Year	Number of Students Graduated	Number of Graduates Surveyed	Number of Graduates Interviewed
2007	35	11	9
2008	26	7	2
2009	27	8	4
Total	88	26	15

Challenges - The quest for former students

One of the anticipated challenges of my field research was to locate the former students for answer to the research question that underpins my study required data for the former students of CAFD. I had the list of with the names of all the graduates, facilitated by the school's secretary. However, I knew finding any or enough students who graduated would be potentially difficult, primarily due to the fact that students may have settled in any one of the 695 communities in Darién and that access to these communities would be hindered by the region's sparsely populated areas and limited infrastructure. There was also the possibility that many could have moved to the city or to another province.

It may not be a surprise that community participants served as key informants to the research. But indeed one of the key findings of this research is recognizing the significant role of community participation, particularly in sparsely populated areas. The main method I used to contact the former CAFD students was word-of-mouth. As outlined in Chapter two, the main informants included: teachers, current students, parents, community patrons whom I met either on the *chivas* (local mini buses) or in the various communities that I visited during my field research experience in Darién. Another method that was suggested by the principal of CAFD was to send a message on the *Voz sin Fronteras* (Voice without Borders) radio station, which is heard throughout most, if

not all, of the communities in Darién. Using all of these community resources, I was able to get referrals and contact information for other students.

I was able to locate and survey 26 of the 88 graduates. Because it was important for me to learn about the remaining 62 to assess whether these students were still living in Darién and what activities they were engaged in, I was able to obtain undocumented information on 22 of these former students. Information on these 22 former students is also included in the Findings chapters, whenever adequate.

Summary

It is clear from the data provided herein that living in a rural region like Darién presents an array of challenges, mainly those dealing with socioeconomic, infrastructural and environmental factors. It is because of these challenges that *Colegio Agroforestal de Darién* opened its doors, understanding that in order for the youth in sparsely populated regions to benefit from an education, special programs like the one adopted by CAFD must be in place to meet the specific needs of rural youth. According to Atchoarena and Sedel (2006), “60 per cent of the world’s poor are still expected to be rural people by 2020...reducing poverty requires first addressing the challenge of rural poverty.” (p.42) Darién is the poorest region in the country; it accounts for 52% of the national poverty.

Atchoarena and Sedel (2006) go on to reinforce that what is necessary—among other things—to provide rural people with the tools for a more sustainable livelihood in rural places are programs with practical educational opportunities. The mission of CAFD is to give the rural youth of Darién the opportunity to improve their rural conditions by providing them with practical skills for sustainable livelihood.

CHAPTER 4

FINDINGS

We are letting foreigners and big businesses come and take possession of what we have, our land, and our natural resources. A day will come when Darién will no longer belong to Dariénitas but to large entrepreneurs and we will be working for them. We will be as they stay here peones (a landless farm worker serving a landlord). So one of the needs we have [in Darién] is to value what we have and to preserve it.

Maribel Cornejo, 2007 CAFD graduate

The purpose of my study was to describe and understand in what ways *Colegio Agroforestal del Darién*, through the use of its agroforestry program of study, contributes to their students' sustainable development. For this study and from a holistic standpoint, sustainability requires the convergence of three building blocks: social progress, economic growth, and environmental protection (Adams, 2006).

I present my findings according to five themes. The first one is important to consider in framing the background data for the study. The other four emerged from the coding of the interviews, surveys and documents. The five themes are:

1. Students' completion of secondary education at CAFD;
2. Students gaining competencies that would make them employable in the agroforestry fields;
3. Students improving their social and economic conditions as a result of attending CAFD;
4. Students increasing their awareness of and/or civic engagement in environmental concerns of the region; and
5. Students remaining in the Darién region and becoming future agents of change in their communities.

The five findings are discussed and interpreted in their respective sections. Section one, in addition to providing statistical graduation information, provides students' narratives describing successes and challenges experienced at CAFD. Section two through four incorporate frequency distribution tables based on the survey, as well as qualitative data from the interviews and observations. Section five, *students remaining in the Darién region and becoming agents of change in their communities* is mostly based on qualitative data from students' narratives, anecdotal and field observations. A last section—Perspectives of Current Students—provides insights into the future plans of CAFD's current students.

In closing, the chapter concludes that CAFD has positively contributed to students well-being, but also poses that there are limitations that may affect CAFD's prospective to offer the needed incentives to motivate the next cadre of students (2011 and 2012 graduates), as the current cadre of students appear to have different interests than those of the 2007-2009 graduates.

1. Students' Completion of Secondary Education at CAFD

Colegio Agroforestal del Darién, which opened in 2005, began with 50 students. Since their first graduating class in 2007, the school has had much success in getting students to complete their secondary education. Seventy percent of the students who began in 2005 received a high school diploma at the first graduation ceremony in 2007. As noted previously (Table 7 in Chapter 3), 26 students graduated in 2008 and in 2009. All received a diploma in Technical Education in Agriculture with a specialization in Agroforestry. Hence, between 2007 and 2009, CAFD graduated 88 students.

Attainment of a high school diploma is a significant achievement in Darién since, as mentioned earlier in Chapter 2, the average years of schooling in this province is 6.4 for men and 6.0 for women, compared to the national level of 9.0 and 9.4 years respectively (*Estadísticas Educativas*, 2009). Therefore, a person with more than average literacy and numeracy skills for a rural family represents the potential for improved economic conditions, not only for the individual obtaining the skills but for the entire household.

Challenges of CAFD Students for graduation

While the school has had success with its graduation rates, they have also had challenges, primarily with students' adjustment to attending a boarding school which has an effect on students attendance and completion of secondary education. According to the principal, Federico Miranda, the average dropout rate is between 10-15% which usually occurs in the 10th grade. Dropout, according to Miranda is usually attributed to "students' inability to cope with the boarding school structure since they have to live with others and especially since they live so far; it is not easy to leave the home of mom and dad" (Miranda, 10/6/10). This statement coincides with the comments from a 10th and an 11th grade student (Eduardo and Ramiro) when I asked them what they thought were the challenges of CAFD students. They gave several reasons:

For me, since I am so far away (the province of Veraguas, about 12 hours), I will say, to see very little of my family; I have never been in a boarding school. Also, to have to accommodate with others, things that I don't like [and] people I

don't like...well, but to study you just have to continue and try not to pay too much attention to it. (Eduardo, 11th grader, 8/26/10)

The other student said:

Well, for me too, it is to be away from my family. Well, to be honest, it is the first time I have been away from my family. I have always been with them, and now, since I entered the boarding school I've been *very much* away from them. Well, I see them on weekends but it is not the same thing as seeing them every day. At the beginning I felt something weird, I came [feeling] very low, and well, I've adapted and I've improved much. (Ramiro, 10th grader, 8/26/10)

Ramiro is from *Santa Fe*, about two hours—each way—commuting from the school. I probed further and asked him: *If you were to speak for your peers what would you say are their challenges here at the school?*

Well, I guess I'd say the same thing that happened to me, away from their family; I have seen that with time we adapt a little to the situation here and after awhile everything changes with time. (Ramiro, 10th grader, 8/26/10)

Eduardo, the 11th grader, then said:

Living with others... sometimes ...the treatment is not good so (pause) ...they do not feel good...they are not treated as they would like ...they are not provided with [enough] support.

We are not satisfied with some practices at CAFD. For example, in general we learn a lot in theory but in practice there is not much, it is one of the challenges we have. If I ask one of my peers how you inject a cow, he will say 'with a needle! (chuckle) ... intramuscular' ...he is going to say that because he

learned it in theory, but if I say do it! He will say ‘I don’t know’ because he has no practice. This is just one of the challenge that so many have told me, because...ehm... well one of the challenges that I also face; but one always try to learn a little more always by putting a little more attention to learning and well...(pause)...these are my challenges and my peers. (Eduardo, 8/26/10)

I found the interview with Eduardo and Ramiro to be refreshing and candid particularly as they continued to share with me their future goals of becoming veterinarian doctors. Both are motivated to complete their education because of the sacrifice their families have made to get them into CAFD. More on the conversation with Ramiro and Eduardo will be discussed later on in this chapter.

Clearly from the accounts of these students, adjustment to a new environment is a challenge for students, and as expressed by Miranda, not adjusting to a new living environment could result in students dropping out of school. However, unlike other regions or more urban communities, the choices for students in Darién to attend other school are poor. There are only five public high schools in Darién to service students that may live in one of its more than 600 communities. Therefore, for many of the students who attend CAFD the choices may be even smaller if they live in communities with limited access to transportation and other infrastructural challenges that may hinder consistent school attendance, or worse, not attend at all.

What seems to be a motivating factor for students at CAFD to complete their education, despite their perceived challenges, is that most of them have goals that they would like to achieve—for themselves and their families. CAFD offers the opportunity

to complete high school as the first marker in achieving their goals. Only a handful of students were expelled in 2007 and 2008 (2007=1 & 2008=2), pointing to the interest of students in graduating from CAFD, once they adjust to the new environment.

2. Students gaining competencies that would make them employable in the agroforestry fields.

This section reveals the findings concerning the competencies obtained in school that may lead to the employment of students in the field of agroforestry. To do so, I first present quantitative and qualitative data on how students perceive their preparation. In addition, curriculum and instruction, as well as the internship experiences are discussed in this section to draw the relationships with students' preparation.

One of the key assessments as to whether the education students receive at CAFD is working is to hear from the students themselves. I wanted to learn from students what they thought was most valuable and most challenging about their education. To do so, the survey that was administered contained a section that allowed both former and current students to state how they felt about the education they received. The students were asked: *How well do you feel the education at CAFD's prepare(d) you for jobs in the field of agroforestry?* Table 8 below provides the answers given by CAFD's former students.

Table 8: Former students' assessment of how CAFD prepare(d) them for jobs in Agroforestry

FORMER STUDENTS	STUDENTS' RESPONSE to QUESTION #x	% OF TOTAL
15	Very well	58%
3	Adequately well	12%
7	Moderately well	27%
1	Not adequately well	3%
26	TOTAL	100%

Clearly the majority of former students felt that CAFD prepared them well. The breakdown of those former students who assessed their education as *very well* includes 40% of those graduated in 2007; 27% of the 2008 graduates ; and 33% of 2009 graduates. It appears then that the first cohort was the most satisfied. In addition to the questionnaire, the students interviewed were asked: *What did you learn that was most valuable to you and/or how do you feel CAFD's education contributed to your future?* The sections that follow attempt to answer that question.

Most Valuable

In the following statements students provide testimonials about how they thought CAFD has contributed to their knowledge and understanding of concepts relating to agroforestry fields and/or the environment that was most valuable. I quote from a number of students interviews:

The former principal, JP Castillo taught us to love, to value and preserve our environment; that is why I decided to study environmental science as a career.

(Josue, 2007 graduate, 8/28/10)

I learned that you can grow a diverse crop; about preserving nature and depend on what you do. They taught us how to measure the trees, what trees to grow in the *potrero* [farms for raising cattle] and what type of crop. (Daniel, 2009 graduate, 9/16/10)

I learned by doing. (Eladio, 2008 graduate, 9/25/10)

I learned the scientific name of the plants, about organic fertilizer. (Kelly, 2008 graduate, 9/26/10)

I learned about preserving the various animal species. I cannot do any damage to the animals or watch other do so. (Inez, 2009 graduate, 9/27/10)

With this education I can have an income and help my family attain a better quality of life; from a social stance, not only do I benefit, but I can help the farmers on how to produce without deteriorating the soil...[I learned] the three components [of agroforestry]...I never heard about this concept before....
(Maribel, 2007 graduate, 8/25/10)

The learning the students are referring to is most consistent with elements needed for the sustainability of the ecology. However, the answer provided by Maribel is most consistent with the holistic meaning of sustainable development; in her response she incorporates both the socioeconomic and ecological relevance of her education which are necessary for her sustainable livelihood and complies with the definition of sustainable development adopted for my research study noted at the beginning of this chapter.

Most Challenging

I also wanted to know what students thought was most challenging about their education. I asked some of the same students and others: *What do you wish was different while you attended the school?* Below are some of their answers:

That they would have added more in the area of forestry. (Dinora, 2007 graduate (8/26/10)

More specialized teachers. (Josué, 2007 graduate 8/28/10)

The tools for the field work. We lacked machines for monoculture and ploughing machines. (Alex, 2007 graduate, 9/18/10)

I wish we had the technology and machinery for the field. In the courses on livestock we got the theory, but not the practical aspect. (Lemuel, 2007 graduate, 8/26/10)

We did not have tools to work with. We learned the scientific names of the trees, but we were lacking labs to test the soil. (Eladio, 2008 graduate, 9/125/10)

The education was good, but we needed a library with specialty books on agroforestry; labs to gain scientific knowledge, while I was there we only used a microscope once, we were the first to use it. (Daniel, 2009 graduate, 9/16/10)

These students' observations concur with what Eduardo and Ramiro—the 10th and 11th graders who, in the previous section, specifically spoke of the lack of application to the theory they learned; they gave the example of injecting cattle. This limitation in the curriculum and instruction addressed by Eduardo and Ramiro, current students has existed since the school began, as Dinora, Josué, Alex and Lemuel are 2007 graduates.

On the other hand, even though CAFD is surrounded by a lush forest, a concerted program to take advantage of the natural laboratory they have in the woods has not been fully materialized. As noted by Dinora, the school does not have a strong forestry program. Based on my interview with the *Tierra Nueva* Foundation's director, there is a possibility that they will get to work with Chemonics, an international development consulting company through their forest management program, which will allow CAFD to fully develop the forestry aspect of the curriculum. This is also another limitation of CAFD.

Curriculum and Instruction

The issues on the limitations in the curriculum and instruction were addressed in the previous sub-section as it relates to the challenges of the students' preparation in the field of agroforestry. Roberto Fernandez, the sustainable animal production

and agroforestry technology teacher, concurs with several of the assertions the students made:

We have a good curriculum, the bad thing is that we do not have equipment for the students to conduct their practice, this is really a limitation. Also, we do not have many reference books in Panama; most of the books come from other places either Colombia or Mexico. In references to livestock, the books are also not from here [Panama]. (9/26/10)

The room the students call the library is also the computer room which, as stated by Daniel, the 2009 graduate, lacks academic books and reference material. The room has about 15 computers, however only about 6-8 maybe working at a given time. The software is outdated. Nevertheless, the students manage to still do their assignments, send their email and even update their *Facebook* account. As a point of note, on an occasion while I was in the room, one student was assisting one of their peers in loading their photos on the *Facebook* account they recently created. So, while the systems may be outdated, they still provide the tools necessary to keep the students current interacting with the technological tools necessary for membership into 21st century social network culture.

However, not all students subscribe to the youth social network culture. I recall having to assist one student with sending an email to *Profesor Alexis*, his agroforestry teacher, who requested the assignment to be sent via email. This particular student did not have an email account, and did not complete the assignment as his web surfing skills were limited. Eventually I helped him complete the assignment and I personally emailed the teacher and explained that the student

needed some tutorial assistance which I provided. I was pleased that the teacher understood. On the other hand, *Profesor* Fernandez noted that some of the students are really good at surfing and finding information, so much so that the teachers have to be very vigilant when reviewing some assignments because they skilfully know how to ‘cut and paste’ information for their assignments.

As outlined in Chapter 3, the curriculum consists of the general high school courses (math, language arts, social science, biology, etc.), with core courses in the fields of farming, forestry, livestock and land management. Because the teaching methodology at the school is based on learning by doing, a good portion of the students’ day is spent in the field. However, as expressed by some of the students, the school is not able to provide many of the outdoor practical experiences necessary in the agroforestry fields.

As clearly expressed by Lemuel, (2007 graduate), Ramiro (10th grader) and Eduardo (11th grader), those students who are interested specifically in raising livestock do not always get to experience the practical aspect of this field in ways that will significantly impact their overall preparation. However, the community has been instrumental in offsetting limitations of the curriculum by providing opportunities for the students to move from theory to practice, as expressed by the principal, Federico Miranda:

In the area of livestock, we do not have any cattle and this is something that is fundamental. Since we cannot conduct the practicum portion of the course, we request assistance from the cattle ranchers; they offer us the opportunity to take

some of our students on the days that they are conducting some type of activity with the livestock; then that is where the students get to do their practicum....

The same occurs with forestry, the companies that are involved in forestry plantation also give us the opportunity to bring our students on a didactic trip to their site so that they can experience the practical side of the field which they only know in theory. (Miranda, principal, 10/6/10)

What is not covered in the school's curriculum, said Miranda, "they will learn during their internship experience." The curriculum requires that 10th graders receive two hours per week of research in projects formulation, while the 11th and 12th graders receive 10 hours per week of field research projects.

One of the characteristic of a place-based education is that the community provides the context for learning; that is, members of the community serve as resource and partners in every aspect of teaching and learning (Rural Schools Community Trust, 2000). This seems to be occurring, however, not in a consistent and concerted manner. The internship component is discussed below.

Internship/Job Training

During the last marking period of the school year, all eligible 12th graders of *Colegio Agroforestal de Darién* participate in the internship aspect of their training in agroforestry. Students engage in a six-week internship at a company/organization of their choice, based on the availability of a slot at that company/organization. In order for students to participate, they must

- be in good academic standing (passing all of their courses)

- maintain a good conduct
- be responsible.⁹

I asked the principal: *How are students' performance evaluated upon completion of their six week internship?* He began by enumerating the requirements. Miranda said that for students to participate:

1. They must develop a project with the business they are interning with and the school.
2. The school supervises the site three times per week to ensure that everything is going along well¹⁰.
3. The students have to complete a report about their internship experience; that is, a small monograph of the work they did at their internship site.
4. The students must present their report. These series of presentation are done over a three-day period.
5. Fifty percent of the evaluation of their internship is based on their site supervisor's assessment; 25% on the content of the monograph; and the other 25% on the presentation of their report.
6. Results of their assessment will count as their grades for the field courses which includes:
 - Agroforestry
 - Livestock Production
 - Projects
 - Livestock Technology

⁹ Responsibility is assessed based on student's conduct during their regular fieldwork experience (their work, their assignments, homework, etc.). The school's philosophy is that "what they do here, they will do it during their internship" (F. Miranda).

¹⁰ While I was not able to follow-up on this statement, I really question the effectiveness of the approach since it is not practical in all cases. For example, *Parque Nacional Darién* is one of the sites where students intern. However, it is hours away from the school, and CAFD does not have the manpower or the funds to supervise these students three times per week as noted by Miranda. Overall, it raises the questions about the implementation of this policy.

Teachers for the other general subjects (math, language arts, etc) design special modules of their course and assign them to the students. The grade they obtain in this assignment plus the average grade of the field courses will constitute their final marking period grades. Therefore, as explained by Miranda, the students' knowledge and results of their internship experience are indicative of the students' level of preparation for the world-of-work. He adds:

The student must be prepared to deal with their day-to-day life as a professional... [so] when we go to the job sites, we say to the supervisor 'I want you to tell me the truth, does the student perform, is the student irresponsible, or insubordinate....These are the things that are going to help us evaluate if the youth is performing the job well. (F. Miranda, 10/6/10)

I asked Miranda about the level of satisfaction of the companies where students intern. He posited that for the most part it is very high, about 99%¹¹ satisfaction. A brief description of the companies/organizations that have been partnering with the school in placing students on internships are listed in Table 9.

Table 9: Institutional and Business Partnerships

NAME	DESCRIPTION	PARTNER-SHIP SINCE
Apical Reforestadora S.A	Teak reforestation	2010
Autoridad Nacional del Ambiente (ANAM)	National Environmental Authority	2007
Banco de Desarrollo Agropecuario de Panamá	Agricultural Development Bank	N/A

¹¹ One of the limitations of this study is that I was not able to visit with any of these companies to confirm the accuracy of satisfaction, purported by Miranda. Also, the school does not seem to be very good at keeping records. When I requested the paper work for the current students (2010), the information was not centrally located, I had to sit in the office with the secretary and watch her search for the reports. The reports were not always signed off by the internship supervisor in the cases where the documentation was located.

(BDA)		
Chemonics International – USAID Project	Global consulting firm in the field of economic growth and development	2010
Comité para la Erradicación del Gusano Barrenador - COPEC	Health and inspection committee for the eradication of screwworm	2007
Empresas Melo, S.A.	One of the largest agro industry in Panama	N/A
Instituto de Investigación Agropecuaria de Panamá IDIAP	Agricultural Research Institute of Panama	2010
Ministerio de Desarrollo Agropecuario (MIDA)	Ministry of Agricultural Development	2007
Panamerican Reforestation	Teak (Tectona Grandis) reforestation company	2007
Parque Nacional Darién	Darién National Park	2007
Teca GKM	Teak reforestation	N/A
United Nature	Teak reforestation	N/A

Some students over the course of their internships receive job offers as detailed later on the next section of this chapter. However, Miranda states that in the case of the teak plantations, almost always students receive a job offer. This is evident from what some of the former students have shared with me during their interviews; some specific cases are addressed in the next section of this chapter.

On the other hand and in the case of the government agencies, even if students perform well enough, it is unfortunate that in most instances the job will go to another person who is politically connected. Miranda said, “Students are recommended by their supervisors and later on [in some instances] they are called to work with the institution.” He adds:

A case in point is Julian Gallardo, a 2008 graduate who interned at BDA, but he is working for the MIDA in Santa Fe....When I was requesting slots for the students, I spoke with the director [MIDA] and he said to me Professor, I am

very happy with your school. We have one of your students [Julian Gallardo] who is working with us... he is the best worker that has come from this generation of young people and professionals that we have had in the last 10 years. (F. Miranda, 10/6/10)

I was not able to confirm this statement with the MIDA, but I did speak with Mr. Antonio Gaitan, the Agronomist in charge of the MIDA in Santa Fe, and the immediate supervisor of Julian Gallardo. He concurred that he was a good worker.

Summary

This section on “Students gaining competencies that would make them employable in the agroforestry fields” confirmed that CADF students are gaining competencies that make them marketable in the world-of-work. Participants agree that the curriculum and internship opportunities are preparing them for the agroforestry field. Yet, because of the limited availability of practical experiences, not all students felt they were receiving a thorough education in the field of agroforestry. We can conclude then that although CADF provides a significant educational opportunity to students and assists them in gaining competencies that will make them employable, it does not go far enough. More would be needed to truly transform the inhabitants of this region.

3. Students improving their social and economic conditions as a result of attending CAFD

This section discusses how students, as a result of their education at CAFD, have improved their social and economic conditions. It provides discussions and narratives on

employment, as an outcome for improving economic conditions, and post secondary education, as an outcome for social mobility. The section concludes by highlighting the narrative of one of the participants who shares her compelling testimony on how her education at CAFD has contributed to not only her life, but that of her family. Both quantitative and qualitative analysis are provided throughout this section, beginning with descriptive frequency tables offering the breakdown of students who are working and continuing with post secondary education.

Employment

As noted in Table 10 below, at the time of conducting the field research, 12 of the 26 students reported on the questionnaire that they were working. Of these 12 students, nine were working either in the farming or forestry industry and all of them were college students, studying a career related to these same fields. On the other hand, three students were working in non-agroforestry related fields: one as a babysitter, another as a security guard and the other as a mechanic. Ten of the students working are in Darién and two are living in Panama.

Two of the students working (2009 graduates), who interned at the Ministry of Agricultural Development (MIDA), received job offers several months later as a result of their internship at that entity and are currently working there. These two graduates work as field supervisors of small farms growing cucurbitaceous plants (melons, cucumbers, pumpkins, etc.). And Julian Gallardo, the 2008 graduate mentioned in section 2 when discussing internships, is also working at MIDA. He interned at a Panamerican

Reforestation and later worked there for three months prior to receiving his appointment at MIDA, where he has been working now for one year.

Table 10: Employment and College Opportunities for Students Trained at CAFD

GRADUATING CLASS	FORMER STUDENTS	% of Total	CURRENTLY WORKING	% of Total	CURRENTLY IN COLLEGE	% of Total
2007	11	42%	5	42%	7	37%
2008	7	27%	3	25%	5	26%
2009	8	31%	4	33%	7	37%
TOTAL	26	100%	12	100%	19	100%

I also interviewed Lorenzo Guillen a 2009 graduate, who works with his father in the family owned mechanic shop; unlike the other two students in non-farming occupations, he is in college studying agribusiness administration. He lives and works in Darién, but commutes regularly at the national university extension in in *Torti de Chepo*, the last township of the province of Panama just about an hour before entering the province of Darién. Lorenzo, who plans one day to have his own family micro business, shared with me during the interview that while at his six-week internship at a teak company (TECA GKM), the engineers liked the way he worked and offered him a job. However, he said:

I started thinking that if I worked there I would not be able to continue studies at the university and I also did not like the methodology they used on the environment; they used too many chemicals and the teak [*tectona grandis*] is a tree that damages the soil a lot. So I did not like that; I spoke with my dad and he gave me the opportunity to work with him in his shop; I accepted because it gave me the opportunity to go to the university and work with my dad in a family business. (9/27/10)

On the other hand, a 2007 graduate who interned at another large teak reforestation company (Panamerican Reforestation Co.) was hired right after graduation and is still working there. His work also includes land measurement for soil erosions among other responsibilities. This student, as I recall from attending the first CAFD graduation which was held in January, 2008, was the class valedictorian. He received a full scholarship to attend the Zamorano University in Honduras; however, unlike his 2007 peers who, while doing my field research, were completing their third academic year in the agroforestry engineering program at the *Universidad de Panamá* in *Villa Darién*, he was completing his second.

If I could draw a parallel between Lorenzo's comments above and this particular 2007 graduate I would say that it seems to indicate that there is a drawback for students who make the decision to work with teak companies. This concern is discussed further in the chapter as I introduce what other students have to say about their experience with this type of entity as a prospective source of employment for the youth of Darién.

As I said before, I also obtained employment information for 22 former students who did not participate in my study. I learned that 17 of these students live and work in Darién. Ten work in occupational fields relating to agroforestry; five are police officers; and two work in a mechanic shop. Four migrated to Panama City; one works for the agriculture and livestock quarantine office at the Tocumen International Airport, another for an agribusiness chain, and the other two students are said to work for the national naval service. The last one is attending Zamorano University in Honduras.

Post Secondary Education

As stated in Table 10 above, 19 of the 26 former students are attending college. Of the 19 students in college, 18 are pursuing post secondary education in the agroforestry or environmental programs; the other student is studying to be an English teacher. Fourteen of these students (42% of 2007; 29% of 2008; and 29% of 2009 graduates) are at the *Universidad de Panamá en Villa Darién*.

I visited the University and interviewed a few of the students on campus, others at their home, CAFD, or at public locales. A number of the students felt that they got a good education at CAFD and the program assisted them in adjusting to the college coursework requirements.

Currently UPVD only provides a technical degree in Agroforestry, what in the U.S. would be considered an associate degree. Most of the students attending UPVD are seeking an engineering agroforestry degree. During my field research, I was informed by one of the faculty at UPVD, that the engineering degree in agroforestry for that region was in its approval stage, with a possibility of starting in the spring 2011; I have not received any confirmation that this took place. On the other hand, 38% of the 11th graders (now 12th graders) have expressed in the questionnaire their intention of migrating to either Panama City or the province of *Chiriquí* to pursue tertiary education as UPVD does not offer what they are interested in, which for the most part is either agronomy or veterinary medicine.

Findings from the questionnaire also revealed that five of the 26 students attended a university since graduating, but did not continue. Three of these students (two 2007 and one 2008) received a scholarship to study at Zamorano University in Honduras, all three were interviewed; Alberto, who attended for one year, left due to an accident which

required surgery so he was sent back to Panama. After his surgery and recovery he wanted to reapply but did not have any money to start the process. Josué ('07) was there for two years, but he was suspended for breaking one of the university rules; he was hoping to return to complete his environmental science degree. When we last spoke, he was trying to get a hearing at IFARHU, the educational scholarship and financial aid institution in Panama. Eladio ('08) who stayed for one year, failed one or two courses and had to leave; however, out of the five students, he is the only one that returned to school and is also at the Panama University extension in Darién. As reported earlier in this section, there is still one student, a 2008 graduate who is currently attending Zamorano University.

Testimonial - Dinora Meléndez, Graduate, 2007

Dinora Meléndez is another 2007 student whom I interviewed. She is studying at the Panama University extension in Darién. When I met her on 8/13/10 during the parent teacher meeting, Dinora was part of a group of World Wildlife Fund (WWF) workers who were participating in a workshop sponsored by Chemonics, an international development consulting firm.¹² After the workshop, she completed the questionnaire and agreed to meet with me at a later date for the interview. We met a few days later in Yaviza, a very busy and high-spirited township about 25 minutes ride in the *chiva* (bus) from the school. Dinora and I sat for the interview in a nearby eating place, where the lively local music of a saloon reverberated around us, coupled with the on and off rain.

¹² "Chemonics is a global consulting firm promoting economic growth and higher living standards in developing countries." <http://www.chemonics.com/AboutUs/AboutUs.asp>

Just as we had completed the interview, she checked her cell phone; I saw a big smile and a sense of awe on her face. She said, “I got an email from the United Nations Office with a job offer.” She read the note to me and said “Oh, I have to tell my father...” The position was for a technical liaison of a climate control project that pertains to the natural resources alongside the riverbanks and watershed areas of the Indigenous communities of Darién. Dinora belongs to the Wounaan Indigenous group and at the time was in her third year of the agroforestry engineering program. Since graduating in 2007, she worked part time for the *Congreso General de a Comarca Embera-Wounaan*¹³ as the director of the natural and environmental resources of the *Comarca* and also for the WWF as a workshop facilitator in her community. She also travelled to Central America to participate in several conferences concerning environmental issues. Dinora was featured on the WWF site (linked to her name on this line) concerning the work she is doing in her Comarca (indigenous village).

Prior to her receiving the good news, I asked Dinora: *Do you think there are job opportunities for all of the students?*

Yes, there is! But we know that some students do not like the field...even though they graduated in agroforestry....No they don't like the rural. Yes, there are many [jobs]; it doesn't matter if you're paid a lot or very little...isn't important...you just need to be interested in having more experience ...you just keep looking and looking... so you can have a good chance of work....(8/26/10)

¹³ General Congress of the Embera-Wounaan Community.

Concurring with this thought, Consuelo Roman, the agroforestry and chemistry teacher, posits that students ought to value the experience more than compensation when looking for a job:

The detail is to get *my first job*; it is not my first job [per se], but *my first experience*...with *my first experience* the money factor should not be taken much into consideration. What must be taken into consideration is the fact that *I have experience* and that later on [with that experience] I will work with a better company or be a coordinator of a better project. (10/5/10)

Interestingly enough, during the later part of the interview, I asked Dinora, “Is there anything you would like to add?” She said:

....Well, you know we're in Darién and here there is much poverty. I am grateful with the school because... (pause)...honestly, at that time my dad, we...we were down and out of resources, then thanks to the school I graduated. Now we are...(pause) and...those who do not have much money or resources, have the facility to have come [to the school] up here helps. (8/26/10)

Needless to say as a researcher, it was a rewarding experience to observe the excitement in Dinora as she experienced the joy of the first fulltime job offer, especially since she will be working within her community in a leadership role. Therefore, this instance certainly served as a good testimonial concerning CAFD’s goal of schooling students to improve their social and economic conditions.

Summary

The findings indicate that 38% of the 88 students who graduated between 2007-2009 from CAFD are employed and 23% are pursuing post secondary education. As students increase their social and economic conditions, human capital for the region also increases. As noted in the literature review, the lack of human capital and social capital are major contributors of poverty in rural areas. In the case of Panama and other Central American countries, differences in human capital explained 13% of rural inequality, while social capital explained 6.7% (Richards 2004). Hence, any improvement in the socioeconomic conditions of rural people that has the potential of also increasing human capital is important for the overall region. CADF seems to be playing an important role in improving the social and economic conditions of individuals in Darién, and the region in general.

4. Students increasing their awareness of and/or civic engagement in environmental concerns of the region

This section reports findings of students' understanding of, and application of, sustainable development practices in their communities. Hence the interpretations are based on qualitative data from interviews with participants and field observations.

During the semi-structured interview process, both current and former students were asked to share their thoughts about what they perceived to be the greatest challenge faced in the province of Darién, and how they defined sustainable development. Their answers allowed me to probe deeper on their understanding of how they perceive the

relevance of their environment as a factor for their well-being; their engagement in issues concerning sustainable development as a whole; and their commitment to the idea of a sustainable Darién for all. I also aimed at knowing how the students connected the issues relating to their environment and Darién with their social and economic well-being. I have selected excerpts of some of the conversations that developed as a result of these questions.

Sustainable development a concept of everyday language in Darién

Even though I have defined sustainable development from its theoretical standpoint, it was interesting to listen to the students make the connections based on their context and hearing the students use it their daily language. Their narratives are rich in significance for the findings of my study, particularly framing sustainable development from a place-based education viewpoint.

Eladio Bernal, 2008 graduate and UPVD agroforestry student said:

The greatest need that we have in Darién is to have people who are prepared [educated], that will help with the environmental sustainability, being able to make it produce, but without damaging it. Also, having someone focused on supporting you in maximizing the care in the utilization of the forest. (9/25/10)

On the other hand, Martin Peña, a 12th Grader, expressed:

....For me sustainable development could be producing your own food....

Sustainability also includes having an education [and] obtaining means for economic sustenance without affecting the environment. (9/26/10)

Maribel, a 2007 graduate, responding to what is sustainable development said:

Producing and developing activities to satisfy the needs of the population or of self, but without affecting the [natural] resources that can serve future generation in satisfying their needs. (8/25/10)

Rolando Guerra, a 2010 11th grader notes that:

Sustainable development is when we produce taking into consideration everything that is in our surroundings...be it the environment, such as our sources of water which is one of the principal causes we must protect. I will achieve this by implementing the knowledge that I acquire. Based on what I am studying I can develop activities [toward this goal]. (9/25/10)

Rolando is one of two brothers at CAFD that are both in the 11th grade. This was one of the few group interviews that I conducted on 9/25/10; it consisted of Rolando, his brother, Ernesto, and two others, Ricardo an 11th grader, and Cecilio, a 10th grader. I was taken aback by the practical knowledge that these student displayed during our interview and our candid discussions that centered mainly on sustainable development. One of the biggest problems with cattle ranch owners is that, in Rolando's own words, "*Arrasan con todo!*" That is, they bulldoze everything! So I asked Rolando: "*How do you understand the relationship between sustainability and cattle farming?*"

Here in Darién, despite ANAM,¹⁴ sustainable practices are very deficient. There are areas that they [ANAM] are supposed to protect, but [what they do] is not sufficient...Cattle ranchers are one of those who bulldoze everything, regardless of whether the trees are medicinal...*they do not care!*..They do not reforest

¹⁴ National Environmental Authority

anything; they knock down all the trees that are on the edge of the rivers and as these trees are knock down the water source is diminished.

I said,

Wait a minute! Aren't you guys sons of cattle farmers? (Both brothers and Cecilio's family are in the cattle business)...Big chuckle! Ja...ja...ja...ja...

He answered:

Well, it is like that, I am telling you based on experience, they bulldoze everything! The chuckle continues...

Here, Rolando demonstrates an understanding of the subject of sustainable development and he makes connection with the consequences of unsustainable practices. Including ANAM in his narrative shows that he is aware of the structures that legislate environmental issues and their level of participation—or lack thereof—in matters such as deforestation. But more importantly, he adopts a nonpartisan stance on the subject of deforestation and who are the culprits, considering his affiliation with cattle ranchers. Rolando would like to get a scholarship to study in another country, perhaps Zamorano. He is interested in agroforestry, specializing in watershed management; he has expressed his desire to come back to Darién to make a difference.

Ernesto is more inclined to study agronomy, but learning about land management and is not sure if he will be staying in Darién. Cecilio also wants to attend college and study agroforestry to have a better future and help his family. On the other hand, Ricardo is not sure what his future holds; out of all of them, his home is the farthest away; it takes him two days to get home to *Paya*, a Kuna indigenous community. He does not live with his father, but with his brother who is a policeman, and according to Ricardo he is

not too involved. He would like to go to the university, but economically it is difficult. He plans to return to his community to live there.

Clearly, one of the challenges for these youngsters studying agroforestry is trying to get parents, family and community members who for years, from their standpoint, have worked the land using traditional methods to learn and implement more sustainable ways of farming. Ernesto said that he has shared some of the techniques he has learned so far, but his father says “It’s about experience and tradition.” Other students as we will hear next have explored other ways of engaging their family and community members in learning some of the sustainable practices aimed at improving the well-being of rural people.

Serendipitously, the concerns raised by Rolando, the 11th grader, concerning deforestation and the consequences of not having trees alongside the riverbanks became evident while I was conducting my field research. On December 8th a number of villages in Darién were succumbed by torrential rain and flooding causing huge damages that kept Darién cut off from the rest of the country for almost three weeks.

As noted from the literature review, shifting cultivation systems contribute to environmental and socio-economic problems. Shifting cultivation occurs when smallholders reuse a land before giving it enough time to renew its natural resources. This occurs through land deforestation and/or usage of the land by cattle ranchers. The land soon becomes unproductive due to erosions and sedimentation of watersheds. Agroforestry systems are associated with more intensive use of land than shifting cultivation systems and can therefore contribute to the reduction of deforestation (Fischer and Vasseur, 2000).

Summary

In general, the narratives of the students in this section reflect their overall understanding of the need for sustainable development practices that would benefit the region. It is clear that CADF has done much to raise students' awareness about environmental concerns and sustainable development. Students are not only knowledgeable about sustainable development, they are civically engaged with environmental issues that affect the region of Darién.

5. Students remaining in the Darién region and becoming agents of change in their communities

Developing future agents of change that will engage the Darién communities in sustainable practices to enhance the overall well-being of residents is one of CAFD's core goals. For this to occur, students must be committed to stay in Darién and share their knowledge with family and community members. Many of these students interviewed expressed their commitment to use their education to benefit the Darién province.

In this section, I highlight instances and methods used by a former student, Eladio, to share with his father and community and the response he received. I also present some of the students' thoughts about the challenges faced in Darién. The section concludes with narratives and analysis of three students who specifically view their need to complete their higher education to benefit Darien and as such evolving as future change agents of their province.

The dialogue that follows was obtained during an interview on 9/25/10. Eladio (2008 graduate), who earlier stated that the most valuable lesson from CAFD was the concept of ‘learning by doing,’ said that he contributes to the needs of his community by speaking with the cattle farmers. He explains to them that having livestock in itself is good but it would not be without forest land, because “the future is worth more than the cattle...” He continued with the following account:

I have two neighbours that have their farm divided, one side cattle and the other forest [as a result of] me and them speaking and I interchanging opinions....My father is a farmer, so later on when I become an engineer, I can seek out the best way to help the environment.

I then asked, “*So since you are young, do they listen to you? Do they encourage you?*”

Eladio replied:

In a way yes! I have earned their trust because when they need help I am there to help and they help me. Also, I was born and raised there (there meaning *La Cantera* in *Santa Fe*).

Eladio spoke about his experience as a child with his father when they were planting beans: “I noticed the *tumba y quema* (slash and burn), and I noticed that much was produced, but after a while the soil and the plants did not produce the same.” He said that when he arrived at CAFD the teachers explained to him that it is not that the farmers do not know, it is just that there is no one to explain to them what exactly takes place when that technique is used. He learned about the need to let the soil rest—fallow—for awhile.

I asked him: “*So what happened when you got home and told your father?*” To which Eladio replied:

Ajooo! (Oh! Chuckle) at the beginning it was difficult because there aren't that many crops that accept shade and light. On the other hand, we would read the books that I bought with the money he gave me to buy them. I let him see the information and he said *mira qué vaina!* (well look at this!), but once in the field, that was another story...it's difficult to do...But I kept trying and I myself went ahead and sowed the trees, and there they are today...He sold everyone of them.

When I asked him if he produced more than when he slashed and burned, he said:

The production was less, but the quality was better. One plant produced more compared to the previous that produced less...at the end the quantity was the same, but better quality.

By strategically applying the knowledge in agroforestry received at CAFD, Eladio reflects an understanding of his sphere of influence. He is cognizant that in order to share what he has learned he must first demonstrate the benefits farmers can obtain by applying other farming methods that are less harmful to the environment. Eladio has gained the respect of the elders in his community, mostly because he has not undermined their traditional knowledge, but instead has taken the time to listen and to share what he has learned by enacting sustainable practices that will make him into a change agent for his community, and ultimately the region of Darién. The perspectives expressed by Eladio herein and his previously mentioned concerns on the needs of Darién—to have people who are prepared that will help with environmental sustainability—serve as evidence of

his commitment to staying in Darién and contributing to the overall well-being of the region and its members.

Two 2009 former students, Daniel Guzmán and Lorenzo Gonzáles, shared their perspective on what they thought were the most compelling needs of Darién.

Interestingly enough both had similar views in addressing the economic development of their region.

Daniel: The economic development of the province. Darién is one of the provinces with the highest level of extreme poverty....So one of the needs is that the farmers have access to the market, that what they produce have a value because what is happening now is that the farmer cultivates and produces the crop and when it is time to harvest the product and brings them to the market there are no demands ... a factor that disappoints the farmers of Darién; and it is why they migrate. The farmers must have a market. A marketing system where the producer will take their own products directly to the market, rather than the producer - broker – market [system]. (9/16/10)

Lorenzo: There is great potential both for the people and for the environment, we have an incredible environment but that authorities have not deemed its importance or the value of Darién and [as a result] we're a little abandoned by the government. Darién is a mine for the economic development of the country because we still have enough natural resources that can be preserved, but currently the wood is being exploited too much and this is gradually depleting Darién.

Since childhood I have had this feeling that this generation that is rising up may change the future of Darién and therefore the entire country. Since we do not have the support of the government, we must start with independent companies to contribute to the sustainable development of the province's untapped resources ... [Employing] sustainable method such as organic farming, livestock but sirvopastoral or agrosirvopastoral system¹⁵. These are a few methods that do not change at all the way to work. The only thing that changes is that not much damage is done to the environment. (9/27/10)

The concepts introduced here by participants reflect their awareness of the issues confronted by the province as well as their involvement in some aspect of the issues and their desire to become future change agents. In many ways, listening to these students, and now relaying their thoughts makes me think that they are already part of a political movement that seeks to bring restoration not only to the people but also the environment. They conveyed their understanding of the social, economic and environmental issues that converge in the day-to-day lives of the people of Darién.

Several students talked about the importance of having more professionals in agroforestry in Darién, and saw themselves becoming a professional for the interest of Darién. This concept emerged as a pattern under the concept of an *education to benefit Darién*, a phrase initially used by Maribel Cornejo, a 2007 graduate who was completing

¹⁵ Sirvopastoral system refers to the practice of combining forestry and grazing of domesticated animals in a mutually beneficial way. Advantages of a properly managed sirvopasture operation are enhanced soil protection and increased long-term income due to the simultaneous production of trees and grazing animals. <http://en.wikipedia.org/wiki/Silvopasture>

her third year of studies at *Universidad de Panamá en Villa Darién* (UPVD). This is how she phrased it:

I plan to finish the engineering [in agroforestry studies] and work to benefit the province of Darién. One of the goals of CAFD is for the students to graduate and be prepared, but *to benefit Darién*. We often see that many students get an education and then they leave and go to Panama City and really, Darién stays the same. We need people from here [Darién] to sow the love to this province so that it can grow and not be the way it is right now. (8/25/10)

Another student Daniel, a 2009 graduate also at UPVD said:

I plan to stay and live in Darién. I think that *all* the students that graduate here must contribute to the province. Because a lot of the professionals that graduate here in Darién almost always choose to leave and go to the city [Panama]; but I think that it would be better to stay here, you know, those of us that have the opportunity to study and work here since we know the area and for me I think it makes it much easier for us. (9/16/10)

The issue of leaving that both of these students are addressing is directly linked to what Corbett (2007) asserts in the literature review. He posits that there is a disconnect that exists between formal education and rural places resulting in outward migration. Therefore, an increase in human capital does not always produce improvement in the socioeconomic conditions of rural communities because of what Corbett (2007) refers to as a “complex relationship that exists between rural education and the sustainability of rural community.” (p.1)

Embedded in the statement “education to benefit Darién,” there is a strong sense of commitment to place, which is what CAFD seeks to develop in their students; it is what they believe would change the pattern of outward migration from rural places as noted by Corbett (2007), the *sense of place* as demonstrated by Maribel and Daniel is instrumental in also developing future change agents that will propel the sustained growth of their rural communities.

Karl Stauber (2001) suggests that one way of addressing concern of migration is to:

...redefine and restructure the rural-serving college and university so as to increase human capital in sparsely populated and high-poverty rural areas....postsecondary education, extensions, and research expenditures are not well targeted to benefit rural communities. (p.54)

I asked Martin (a 12th grader, soon to be graduate) what were some of his future plans and he said to attend college in Panama City or Chiriquí to study agronomy which is not offered at the university extension in Darién. To the question: *Do you plan to return to Darién?* He said: *Yes!* I can't leave it (smiles). (9/26/10)

The worldview that Maribel (2007 graduate), Daniel (2009 graduate) and Martin (12th grader) reflected herein speak volume to their resolve to use their education to benefit Darien. Maribel is the same student that earlier stated that her education would contribute not only to her socioeconomic development, but that of her family and that of her community. Maribel's worldview on what an education represents for young people like her, growing up in Darien, reflects not only her level of commitment to stay in the region, but also her understanding of the challenges and needs of the people of Darien.

What is also apparent about these students is their willingness to become the agent of change that CAFD views as one of the solutions to the grave problems—mainly poverty and environmental degradation—that affect the Darien region.

CAFD has also been successful in transmitting to its students a sense of commitment to remain in Darién. Given the fact that academic success most often results in students leaving the area where they grew up, the understanding by students that “Education is to benefit Darién” is a great success.

Contributions of CAFD: A Summary

The five sections discussed in this chapter provided the groundwork to answer my research question: *In what ways does a school with an agroforestry curriculum contribute to the sustainable development of youth in Darién?* Overall, the findings within each section brought together evidence of the contribution of the school’s agroforestry program to the social improvement, economic growth and environmental preservation—the three building blocks of sustainable development—of the students and communities.

CAFD has been instrumental in:

1. Raising the high school completion rates of young people in the region
2. Developing their competencies for employment in the area
3. Improving their social and economic conditions
4. Increasing their awareness of environmental concerns and sustainable development

5. Developing a commitment to remain in Darién

Despite the success of the CAFD program, the findings within each section also drew attention to some of the limitations in the CAFD curriculum. The next and last section in this chapter draws attention to some perspectives of the plans of current students at CAFD.

PERSPECTIVES OF CAFD'S STUDENTS:

Preparedness for work and future plans

This section will introduce findings from the quantitative data derived from the surveys in which students evaluate their preparedness for the world of work, and their future plans concerning employment and higher education. This data is sometimes substantiated by qualitative data gathered from observations and formal and informal interviews with study participants. The qualitative data is—at times—presented using personal narrative to construct meaning of the social and cultural environment being observed. In this case, the school and its members are viewed as part of an ecological system¹⁶ with each member contributing and influencing each other at different levels. The section concludes with perspectives concerning future challenges that CAFD could face in fulfilling their mission and goals based on the perceived viewpoints of the current students.

¹⁶ The ecological system is a theory on human development that examines the interrelationship between children and their social and cultural environment. It was developed by Urie Bronfenbrenner. <http://pt3.nl.edu/paquetteryanwebquest.pdf>

Preparedness for work

Table 11 below shows the data from the current students' assessment of their preparation for work. As shown in Table 11, current students seem quite satisfied with their preparation for the world of work.

Table 11: Current Students assessment of their preparation for the world-of-work

STUDENTS' RESPONSES	NO. OF CURRENT STUDENTS	% OF TOTAL
Very well	29	35%
Adequately well	17	21%
Moderately well	27	33%
Not adequately well	9	11%
TOTAL	82	100%

Those who felt that CAFD had not adequately prepared them pointed to the lack of resources to apply the theory they were learning and lack of appropriate tools, agricultural equipment and technology. Without these resources, some students asserted “we don’t learn the practical side of agriculture.” These thoughts are in line with previous comments made by former students and even the livestock production teacher in terms of lack of tools and machinery for the students to adequately engage in the field work experiences. Therefore, confirming “lack of practical application of curriculum” as a limitation of the school.

Planning for the Future

Table 12 below breaks down the 11th and 12th graders' plans for their future as it relates to employment pursuit and/or college attendance.

Table 12: Graduation plans of current (2010) 11th and 12th graders

GRADE	CURRENT STUDENTS SURVEYED		WORK IN DARIÉN		ATTEND COLLEGE AND WORK IN DARIÉN		MOVE TO AND/OR ATTEND COLLEGE IN ANOTHER PROVINCE		NO SPECIFIED PLANS	
	N	%	N	%	N	%	N	%	N	%
11 th	40	63%	10	25%	8	20%	22	55%	0	0%
12 th	23	37%	2	9%	7*	30%	7	30%	7	30%
Total	63	100%	12	19%	15	24%	29	46%	7	11%
(*) includes one student that will only be attending college.										

The 2010 11th graders cohort is the largest the school has had. Based on the survey results, it appears that only 18 or 45% of the 40 students are planning to stay in Darien to either work and/or attend college. The other 22 or 55% plan to move to another province. An interesting phenomenon is that this group of 11th graders, listed the province of *Chiriquí*, another agricultural region, on the western side of Panama as the place where they would like to study; they represent 38% of the 22 students who plan to relocate. In the survey most stated their plan to study agronomy or veterinary medicine; neither one of these careers are currently available at Darién’s national university extension.

If the plans of these 11th graders do not change by graduation—December, 2011—then this could be interpreted as students not fully committed to becoming agents of change in Darién, and hence not fulfilling the mission of CAFD. I must say, however that there were a few students, like Rolando and Carlos, previously mentioned in other sections of this chapter, who, while planning to study in *Chiriquí*, stated unequivocally that they plan to return to Darién to make a difference.

Subsequent to the initial questionnaire administered on 8/4/10, a post-questionnaire was given to the 12th graders on graduation day (1/4/11). Fourteen of the 25 graduates participated in this survey. Table 13 below shows the results.

Table 13: Post Graduation Plans of 12th Graders

2010 GRADUATES POST SURVEYED		WORK IN DARIÉN		ATTEND COLLEGE & WORK IN DARIÉN		MOVE TO AND/OR ATTEND COLLEGE IN ANOTHER PROVINCE	
N	%	N	%	N	%	N	%
14	56%	2*	14%	7**	50%	5***	36%
(*) One student stated that he already had a job with a teak company, <i>Teca GKM</i> (**) one of these students will only be attending college as he received a full scholarship. (***) Two students plan to attend college in Panama City and three students plan to go to the Panama University Extension in the Province of <i>Chiriquí</i> , on the western side of Panama.							

In Table 13, we see that 64% of the graduates’ surveyed plan to either work or attend college in Darién. It seems that the recent graduates intend in staying in Darién at greater rates (64%) than the 11th graders (45%).

One of the goals of CAFD is for students to commit to staying in Darién to become change agents within their communities. Michael Corbett (2009), author of *Learning to Leave: The irony of schooling in a coastal community*, believes that “holding youth in rural communities and small towns, educating them specifically for life in those places would be a grave mistake” (p. 7). Instead, he suggests that:

...rather than keeping rural youth in place, a more appropriate challenge is to:

- 1) support and convince most of these youth to go and pursue higher education

and a more cosmopolitan experience, and, 2) to create the conditions for their return to rural communities that make this return both feasible and attractive.

Thus, leaving and returning should each be supported in a number of ways, all of which focus on the sustainability and importance of rural communities. (p.8)

I may be somewhat partial to this solution as I have experienced leaving and later feeling compelled to return to the place called home. However, I feel that the challenges that rural youth face today are more complex in nature than those I faced when I was at that crossroad. Students migrating from rural areas into more urban or suburban areas are confronted with a number of issues, particularly socio-economical.

However, when I spoke with one of these students he gave me a perspective that leads me to believe that some of them may have an intrinsic motivation to study, become professionals and return to Darién to benefit both their family and communities. When I asked Carlos, an 11th grader, if he would be attending college he stated that because his parents are not financially resourceful, he plans to work for at least a year so that he could save some monies to pay for his education, in the event he does not get a scholarship to attend the Zomorano University in Honduras. As an alternative, he would migrate to attend the national university extension in *Chiriquí* to obtain a degree in environmental engineering. I asked him: “*Will you be coming back to Darién?*” He succinctly replied:

I plan to return to Darién to then apply what I have always dreamed of. *I am not going to prepare myself to give the benefit to another province but to my own province.* Darién has been forgotten by the governments, and when we are going to represent Darién [people] say to us ‘those from Darién are always last.’

I want to demonstrate that Darién [and its people] is valuable and we should be given the proper attention and respect. (10/5/10)

Carlos has brought up the issue of brain circulation and the impact it can have on communities like Darién that depends on the increased human capital to thrust the local economic growth needed to make livelihood sustainable. Rural people depend on all family members to contribute to the household sustenance. The fact that he could clearly identify the knowledge he gained from his education as a potential benefit for his family and province, speaks volume of the way the young people in Darién are being prepared vis-à-vis formal education at CAFD and the prior knowledge developed as part of their sociocultural construct.

Youth Culture at CAFD—

Like many western youth, CAFD students adhere to the trends of modern day youth culture, which has extended to rural areas such as Darién. They are on *Facebook*, they talk about having the latest cell phones—blackberry, iPhone—even in the middle of the rural rainforest region of Darién; at nights, during their spare time (curfew is at 9PM), they are up and about in the pitch dark forest walking around seeking a signal for their cell phone. It is a sight to behold. My metaphor is that of a flock of lightning bugs sometimes only identified by peers who know each other's imaginative ring tones; a whisper in their voices; or an abrupt S.O.S call to one of the not-so-fiery peers stationed

in their dorms, to borrow their phone, their phone chip or minutes for their phone.¹⁷ You name it; their technological savviness left me in awe.

I bring these observations to light because they directly relate to the trends characteristic of the formation of youth culture identity. With the proliferation of social networks and the more easily accessibility of technology, students can be globally connected anywhere at any time. Mortimer and Larson (2002) affirm that “with youth in remote corners of the world connected to one another and to information on how their more and less affluent peers elsewhere live...young people throughout the world are increasingly online, despite a persistent digital divide in computer access cross-nationally and socioeconomically” (p.9). This current group of CAFD students has benefited from this technological circulation more so than previous students, particularly those who graduated in 2007 and 2008. As a point of note, the class of 2010 registered the lowest internship participation since the school’s opening. Only 36% of the 25 students scheduled to graduate were eligible to participate in the internship program, compared to 67% in 2007, 100% in 2008 and 62% in 2009.

Hence, due to their increased exposure to the technological socialization, their perspectives may be different. They may see themselves as having more opportunities to diversify the options they have at CAFD, and as such, just doing enough to obtain a high school diploma may be more important than doing the perceived extra work to engage in an internship because the future that they see—as a result of their exposure to the outside world—may be different from the first groups of students who seem to have developed a

¹⁷ In Panama, there is a way of texting minutes to other cell phones through the pre-paid phone carrier. There are so many daily promotions and competitions for phone time and they students know all of them.

more sentimental commitment to forge a life in Darién that not only will benefit them, but also their community and the region.

Conclusion

There is enough evidence to suggest that CAFD, by using an agroforestry curriculum and building on its mission and goals, has been instrumental in making significant contribution to their students’—former and current—human development and the sustainable development of Darién. Table 14, which follows, reflects the summary of students’ employment outcomes based on the data collected for 2007, 2008 and 2009 graduates. This includes the undocumented data for 22 graduates.

Table 14: Employment Outcome 2007-2009 Graduates

FINDINGS (*)	NUMBER OF GRADUATES	PERCENTAGE OF TOTAL
Working in fields of agroforestry	21	64%
Working in other fields	12	36%
Total Working	33	100%
<i>Working in Darien</i>	27	82%
(*) Includes the undocumented data for 22 CAFD graduates		

Based on the findings on employment outcomes for the students who graduated between 2007 and 2009, 33 or 38% of the 88 graduates are currently working. Eighty-two percent of the 33 students working are in Darién and 64% of all of the students working are in the fields of agroforestry.

On the other hand, Table 15 shows the summary results of students attending a postsecondary education institution. Eighty percent of the graduates that continued onto college are in Darien and 95% of all students attending college, are studying careers related to the agroforestry fields; 14 are at *Universidad Nacional Villa Darién*.

Table 15: Postsecondary Education Outcomes for 2007-2009 Graduates

FINDINGS (*)	NUMBER OF GRADUATES	PERCENTAGE OF TOTAL
Attending college(**)	20	23%
Attending college in Darién	16	80%
(*) Includes undocumented data for 22 CAFD graduates (**)Percentage based on all graduates between 2007-2009 which is 88.		

With just six years of being established, the outcome of CAFD’s students reflected above speaks volumes for the work and significance of the school in Darién. Overall, I believe that the findings demonstrate that not only the graduates will be able to improve their socioeconomic conditions, as a result of their increase in human capital, but also that the student’s are genuinely interest in 1) becoming agents of change in their communities and the greater region; and 2) are vested in the idea of living in Darién and taking care of and preserving their environment.

Nevertheless, the findings reveal that there are several limitations, the most salient is in the curriculum and instruction of the agroforestry education; this limitation could be attributed to the need for more financial resources to support the overall requirements that

a specialized curriculum such as agroforestry requires. These findings are further discussed in Chapter 5 and recommendations are also provided.

CHAPTER 5

DISCUSSIONS, RECOMMENDATIONS AND IMPLICATIONS

... [we want] students to see and find that place-based education is positive...that Place-Based Education [in Darién] is Possible”

Consuelo Roman, CAFD Agroforestry Teacher

The purpose of this study was to learn about the alternative education program *Colegio Agroforestal de Darién (CAFD)* offers to the youth in Darién. Their mission centers on three goals:

1. provide their students with competencies in fields germane to the labor industry in the province of Darién (forestry, fishing, agricultural and cattle farming);
2. increase the human capital of the region by encouraging students to pursue postsecondary education, engage in entrepreneurial ventures and/or enter the labor force; and
3. raise a cadre of students who will commit to preserving the environment and promoting sustainable practices in their communities.

As discussed in the previous chapter, the overall findings revealed that CAFD, through its agroforestry program has significantly contributed to its students' sustainability which resulted in:

1. students' completion of secondary education;
2. students gaining competences that would make them employable in the agroforestry fields;
3. students improving their social and economic conditions;
4. students increasing their awareness of and/or civic engagement in environmental concerns in their region; and
5. students remaining in the Darién region and becoming agents of change in their communities.

Nevertheless, the findings also revealed salient challenges for CAFD mainly attributed to limitations in their curriculum and instruction. These limitations, as evidenced in the earlier chapter by CAFD's former and current students, resulted in students:

1. The lack of appropriate practical experiences connected to the theory learned in class. Experience includes not having agricultural equipment, livestock and tools for the field related activities. Students from 2007, the first graduating class, as well as 2009 and current 2010 students addressed the same condition; this pointed to the fact that this limitation has been recurring since the inception of the school.
2. Not having supplemental academic resources to pursue further understanding of agroforestry related field. Specifically a student spoke about not having an appropriate library, proper laboratories and computer stations. These were confirmed during my observations and also addressed as a problem by teachers and principal. To facilitate discussion, the conceptual framework adopted for this study will be used to address the limitations encountered as well as to offer some recommendations.
3. The lack of consistent teaching personnel that is able to provide continuity and support to projects and activities developed by the students and/or the school administration.

These are the three major issues highlighted by students, staff and teachers that directly relate to the curriculum and instruction. To facilitate this discussion, I focus on the

limitations in relationship to the conceptual framework of this dissertation. Following are the issues that specifically address these limitations.

1. **CAFD Curriculum and Place-based education framework:** While the curriculum enacted at CAFD corresponds with components of a place-based education paradigm (curriculum is rooted in the context, students can construct on their existing knowledge of place), the core curriculum is not interconnected with the general coursework in ways that allow students to critically make meaning of their place and their overall learning. Based on my observations, the general coursework appears to be disconnected from the core.

The Rural School and Community Trust (2000) notes that students can learn grammar and syntax by chronicling issues [perhaps on deforestation] that are community noteworthy by producing a local newsletter; during my interviews, some students expressed their interest in producing a school newsletter, but due to the high turnover rate of teachers, it is difficult to have continuity of projects. Another example that the RSCT suggests as it relates to science classes is to join the students' contextual knowledge with scientific understanding.

To a certain extent, I believe that CAFD has managed to accomplish most of the theoretical and part of the practical components of the curriculum for the agroforestry related courses, but not for the general courses such as biology or chemistry, which are more prescriptive based on the Ministry of Education's standard. During my informal observations on one of my visits to CAFD, I sat in the 12th grade biology class of 26 students. The topic was on algae, but the teacher focused on the red algae.

I found the information to be very interesting, though many students were really not paying attention, particularly since the teacher was reading the notes for students to copy as he read. Parts of the notes read:

Japan uses these [red] algae as food....The Agar is extracted from Rhodymenia for many home usages and cultivation....Chondrus (Irish Moss) it is used to produce chocolate; It prevents the sedimentation of the cacao. (field notes 7/27/09)

After the class I ask the teacher [who is no longer at the school] if these algae were found in Panama or in Darién. He stated that they did have that species in Panama; however I left still unclear about where in Panama this type of red algae could be found. I reflected on the class. I thought about the agricultural diversification and the education of rural youth, addressed in the literature review by Richards (2004) and the fact that Darién produces large amounts of cacao, but except for export, I am not sure if the people use it for anything else. Perhaps the students could engage in a project to actually understand the sedimentation process and how it interrelates with their chemistry class to determine the breakdown of the chemicals from the algae that prevents the sedimentation of the cacao.

While this is just one example, it serves as an instance to show how courses can be connected using local themes and resources to make learning meaningful to students. Quite frankly, I found it difficult to follow, although I had some knowledge about the various types of algae. It appeared to be particularly meaningless to students since they did not have a slide show that

showed the variety of red algae which would have made the course more interesting and perhaps elicit participation from the students.

A diagram with a paradigm of what a context based curriculum that is fully integrated is on Figure 2 in the literature review section.

2. **Teacher turnover:** During my field research, three teachers got their *nombramiento* in the city, something they had been awaiting to leave Darién (language arts, Spanish, and one of the agroforestry teachers). Turnover rates have been an issue for the school since its inception; as explained in the literature reviews that appears as Appendix A, this occurrence is primarily due to the lack of educational policies that address regional concerns and needs. Not having a cadre of teachers who are committed to work with them in preparing students for sustainable livelihoods in Darién, is affecting CAFD potential to accomplish their mission. In addition to teacher turnover, since the establishment of the school six years ago, they have had four principals, with Prof. Miranda serving twice as an acting principal over the past three years, prior to his appointment as principal one year ago.

Certainly, this is an issue that is difficult to address as currently the school does not have the necessary funding to hire all of their teachers and depends heavily on the Ministry of Education to provide the needed services. This problem is aggravating since regional policies governing the selection and appointment of teachers in special needs area such as Darién are not in place. One of the key reasons for the inequity in the educational opportunities of rural youth is because of the need for decentralized policies that address the specific needs of the context. According to a former

MEDUCA's regional director of Darién, approximately 90% of the teachers appointed to work in Darién are from other regions of the country.

3. **Internship Program:** While the school has a clear outlined internship plan for its students, only 7 out of 25 attended the internship program. I noticed that much of the supporting documents that are part of the internship package, including the evaluation of the internship supervisor, were either not available or not signed by said supervisor. I believe this is a very important component of the school and it needs to be properly documented. However, considering the natural disaster that occurred in the month of December, which paralyzed the province prior to the completion of the students' internship, it could be attributed to circumstances that were out of their control. However, the significant low number of students participating in the internship program—the lowest in four years—may be pointing to a different phenomenon, beyond parents' lack of interest, as Miranda referred to earlier.
4. **Job Attainment:** While there are currently no written parameters that establish the roles between industry and schools, at CAFD [or in Panama as a whole], there are existing partnerships established with organizations such as the National Parks Authority, agricultural related government agencies, and most, if not all, the foreign teak reforestation companies. These entities have committed to providing CAFD students with the practical on the job experiences they need to enter the world of work. However, a more binding partnership needs to be established as explained in the following recommendations.

Recommendations

The following are recommendations for CAFD to support their students in preparing them for employment and increase their opportunities and participation in the socioeconomic and ecological development of their region.

- **Knowledge-intensive technological training:** For students to be competitive in the job market, they need to be exposed to updated technological tools to facilitate 21st century knowledge necessary to adapt to the needs of the global economy. Digitally driven tools, such as GPS and GIS mapping activities and laptops, are needed to facilitate learning.
- **Community participation and Capacity Building:** By creating more opportunities for the community members to learn and exchange information, experiences and resources with the schools, both students and school administrators can develop a larger social network pool that could develop into potential employment and ventures as a result of the increase social capital derived from community engagement. One way to begin this process is by increasing the role of stakeholders, particularly the parents into the practical aspects of the schools' curriculum. Allowing community members to facilitate activities (workshops, field trips to their farms, etc.) in a more vigorous way, again, would give the school more exposure, in-kind resources, and sources for the employment of students. Overall, the agency of the school, the students and the community will be augmented.
- **Partnerships and Collaborations:** The role and function of industry in contributing to the school-to-work transition should be incorporated into the public educational ministries' strategic plans. CAFD should create more binding commitment with

industry. Students should be given the opportunity during their upper secondary years to intern with public and private institutions on a continuous basis not only during their senior year. This would allow the students to obtain more experiential learning earlier on, which will increase their prospective of attaining long term employment. The internships should be subsidized by public and private institutions.

Also, the work performed by the students in the community during their school break (3 months) could be capitalized by school by requesting them to submit a report of how they applied certain practices related to the fields of agroforestry. They could also participate in community projects or service learning activities that identify strengths, weaknesses, opportunities and threats (SWOT) within their communities.

CAFD can begin developing more collaborative relationships, on a local level, with the industry by sharing the goals of the school, the students' accomplishments, and by finding ways of building collaboration with and incorporating the local public and private businesses in the schools' year-round activities and curriculum.

- **Agro Equipment:** The school does not have agricultural equipment on premise and often has to depend on the community for practicum activities. While the community provides the setting for the curriculum, CAFD needs to be more proactive in developing an 'academic field practice program' which incorporates the members of the community in ways that are holistic.
- **Venture Project:** The school should have students develop venture projects—especially environmental issues—involving the school and their local communities. At the end of the school year, these projects could be shared through a region-wide

event that highlights the students' projects, including the media and high level agricultural government officials.

Despite the challenges faced by CAFD, they are still fulfilling their mission, perhaps not in the proportion and timing as some expect. The students as a whole, as indicated in my research study, believe that they received an education that will contribute to their overall sustainable development.

The reality however, is that in order for CAFD to continue the work, financial resources are needed. Education policies that support continuity in Darién are required to continue improving the lives of the youth in Darién, especially those who accepted the challenge of 'learning to stay' in Darién.

This study is significant because, as a whole, there is a lack of literature that speaks to the implementation and outcomes of regional educational policies for Panama's education system and in particular, about the role of education in contributing to the economic growth and human development of youth in rural and indigenous regions of Panama. My study addresses these matters and seeks to serve as a paradigm for qualitative research vis-à-vis the impact of technical and professional training on human development and equity in educational opportunities. All these elements are purported to be part of the mission of Panama's Ministry of Education.

Conclusion

Connecting the Findings to the Literature Review

This study began by addressing salient issues in the Education system of Panama, based on a 2006 CONACED report issued to the president of the previous administration

of Panama (2004-2008). One of the issues CONACED reported and I used as a premise for my study, was the lack of quality and equity of educational opportunities; CONACED noted this problem as being most serious in poor regions and in indigenous communities.

My study was about one school, sponsored by a private foundation with collaboration from the Ministry of Education of Panama, and support from local and foreign stakeholders to ameliorate the grave educational problems that confront the province of Darién, described by CONACED. Notwithstanding the many salient findings and recommendations of CONACED's reports (2006 and 2008) other initiatives discussed in my literature review (see Appendix A), and the modernization and quality educational plans—mainly funded by the World Bank—for the Panama education system, there is copious information that supports the fact that prior to and since these reports were written, and funding was established to ameliorate the educational marginalization of poor rural and indigenous populations, not much has changed.

This study is therefore significant in looking at alternative educational solutions, for creating opportunities that have the potential of improving the livelihood of rural and indigenous youth. It contributes to the literature on rural development in Latin and Central America, for which there is a paucity of qualitative research conducted in the field of education. The findings derived from CAFD, as mentioned before are not intended to be generalizable, but to be considered as an educational paradigm with positive results in increasing the socioeconomic conditions of rural and indigenous youth and increasing their knowledge and interest in preserving their ecosystem, which will ultimately improve the well-being for all stakeholders. This educational paradigm recommendation is particularly relevant as we consider some of the results of the

initiatives and discourse on the Panama education system as a “...fundamental instrument for human development; for prosperity, equitable opportunities and for social mobility...” (MEDUCA, n.d.).

Raúl Leis¹⁸ a member of CONACED, reflecting on efforts of CONACED, said:

[As we are]... finishing the term of the Council, I believe that our efforts and work was not properly valued; perhaps even disrespected by the national government. If it was not so, we would not have the lamentable state of the Panamanian education today; [it] would be another. But I think it was worth all that we learned and everything we wanted to teach in good faith, despite the deaf ears and the closed doors of the circles of power (Leis, 2009, #5).

On the other hand, Juan Bosco Bernal (2001), a former minister of education of Panama, writing 10 years ago said,

The Panamanian education has gone through a difficult path and at times contradictory. It [the education system] could have been an essential factor of social mobility to reduce poverty and promote human development, but its offerings and, above all, *its lack of relevant content* [emphasis added], have prevented the fulfilment of its mission in this historic moment in the country (p. 67).

These words still seem relevant today.

¹⁸ Rau Leis was a prolific writer, sociologist and educator, and was the president of the *Centro de Estudios y Acción Social Panameña* (Panamanian Center for Social Action and Studies), a non-governmental institution dedicated to the education of the masses and action research for more than 25 years. He died in April of 2011.

What comes to light from this review on the current state of Panama's education system is that despite the internal and external reports, government agreements and the allocation of significant financial resources aimed at improving the overall state of the education system, considerable changes have not been observed. It raises questions about the nature of the intended reforms. I question the purpose of the significant investments made by agencies like World Bank. Why do they continue to provide funds to Panama, regardless of their own assessments which reflect a lack of effective results in ameliorating the dire state of affairs of Panama's education system? Particularly, why rural and indigenous people are still lacking the most basic educational opportunities to improve their social and economic conditions?

Bernal's concluding statement may shed some light on my questions. He posits that the education system does not only reflect a large gap that points to inequities, but that it also reflects "the condition of a disparate and exclusivist society, with two education systems or a system with two speeds for the same one society"(p.67).

While the literature is not encouraging, I believe that it is possible, through the continuous concerted efforts of organizations like *Fundación Tierra Nueva*, rural education advocates and students like Carlos and Maribel—two of the many students who succinctly articulated their intention to use their education for the benefit of Darién—to create and maintain educational policies that support the sustainable livelihood of rural people. I am confident that the mission and goals of CAFD and those who support its efforts will be achieved; that is, to build a 'new earth,' a cadre of young people becoming agents of change for the sustainable future of *Darién*.

From a global perspective and policy implications, this dissertation only just scratches the surface of the challenges youth in poor rural and indigenous regions face on a consistent basis, to obtain equitable educational opportunities. Most of the recent literature on the application of agroforestry practices in developing countries like Panama particularly those endorsed by institutions like UNESCO, AIDB, FAO and others, posit that educating farmers in the practice of agroforestry land management has the potential of improving rural livelihood and reduce poverty. Therefore, I would welcome the opportunity to conduct a longitudinal study of *Colegio Agroforestal de Darién* graduates; they could serve as a paradigm to investigate the long term socioeconomic outcome of these youth vis-à-vis the concept of improved sustainable livelihood.

LITERATURE REVIEW

...We know that there are two Panama, one that dazzles for its large buildings and its service economy;" and the profound Panama—our Panama—that of the majority, which is a Panama [that is] still very battered, extremely vulnerable, a Panama [of people] that undergo rough times. You will return to [serve] the entire country, but above all, to serve those that are having a rough time...Panama needs men and women like you.

Monseñor Rómulo Emiliani,¹⁹ Founder Fundación Tierra Nueva/CAFD

This review of literature summarizes empirical and theoretical research that pertains to my research question: *In what ways does a school with an agroforestry curriculum contribute to the sustainable development of the youth in rural Darién?* The conceptual framework that guides this review is organized around three dominant categories of literature: 1) rural development and education—Panama and Latin America; 2) place-based environmental education; and 3) agroforestry systems. Sustainable development will also be addressed as a subcategory of rural development.

Panama Education System

As recently as 1995, Panama extended mandatory education from the sixth grade up to the ninth grade as part of the basic education program; hence students receive six years of primary education and three years of lower secondary education [the equivalent of middle school in the U.S.]. As a result, and over the years, at least 12% or 400 of its 3,383 schools have converted to basic education centers that is, grades K-9. After completion of basic education, students are encouraged—but not mandated—to continue their upper secondary education (grades 10-12), which is free. There are 144 upper

¹⁹ *Monseñor Rómulo Emiliani en Zamorano. Part of a message to Panamanian youth (approx. 100) at the Zamorano University in Honduras, on el 14 de junio de 2009.*

<http://www.youtube.com/watch?v=uJbotbwXNvE&feature=related>.

Zamorano is a private, undergraduate, not-for-profit international agricultural university located in Honduras, founded in 1941.

secondary schools of which 79 are professional and technical high schools and 65 are academic high schools. The 2007 statistical data report reflects a total of 619,425 students for all grades during that academic school year (*Contraloría Nacional*, 2009). Of the total number of students registered in the 2007 academic years, 219,641 were in grades 7-12.

In Panama, schools are organized by three educational regions: urban, rural and indigenous. Urban educational regions are characterized by communities that are easily accessible by public transportation and with basic infrastructure that includes energy, water and roads. Rural educational regions are characterized by schools located in areas that are difficult to access. Difficulties accessing schools are usually associated with the lack of infrastructure such as transportation, electricity, potable water and/or roads; in most instances, getting to school may require students to walk long distances and /or cross a river by canoe or motorboat. Also, schools in rural regions are largely characterized by one-room classes, known in Panama as *multigrado*, where one teacher is responsible for teaching students in different grades in one classroom during the same period. The indigenous educational regions are similar to the rural regions except they are distinguished by autonomous indigenous territories known as *comarcas*. Hence, all the students attending the schools in the *comarcas* are indigenous people and the assumption is that some academic instruction is in their native language. However, reports issued by the *Consejo Nacional de Educación*²⁰ (CONACED) (2006 & 2008) indicate that implementation of bilingual intercultural programs for the indigenous population—originally programmed to begin in 2005—was still not instituted despite the fact that resources for implementation were already available. This lack of

²⁰ National Council of Education

implementation of the program resulted in the high rate of indigenous students who were left back and the indigenous students' dropout rate increasing about twice the amount of the average national rate (CONACED, 2008).

As a point of note, and while the review of literature provide an overall review of the Panama education system, the focus of this study most relevant to the rural and indigenous educational regions of Panama; with an emphasis on the educational implications for upper secondary (high school) students of Panama.

The mission and vision of the Ministry of Education (MEDUCA) of Panama is: [to] transform our education system into the fundamental instrument for human development; for prosperity, for equity of opportunity, and for social mobility. An education system that will increase sustainable development productively, economically and socially...

And that by 2015, Panama will have an educational system of the highest quality and effectiveness, one that is properly institutionalized, sustainable over time and widely supported by society [MEDUCA, n.d.].

Education is often recognized as a major, if not *the* major, contributor of potential for human development. The increase in development impacts a person's well-being and their quality of life (Bernal, 2001). Bernal (2001) notes that based on a country's economic growth focus, education is surely a way of increasing productivity and competitiveness; he explains that this concept of education for human development was drawn from industrialized countries during the mid sixties and later on applied as a concept or a model for poor and developing countries to follow. As such, education was

considered one of the reasons that could explain the economic growth of a country. He continues to posit that:

...developing countries, even with natural resources, and sustained economic growth rates, are facing serious problems of inequality, poverty, environmental degradation, nutrition, disparities between genders and democratic freedoms. As such, equity [in education] as an equalizer for capacity building for people to function in society, to be and do, and to choose the lifestyle that they value most, has been seriously threatened in Latin America and Panama (Bernal, 2001, p.6).

In 2006 CONACED (The National Council on Education) published a report for the office of the then president of Panama, Martin Torrijos, in which they outlined a series of critical problems of the education system. A monitoring report was later published in 2008. Both are seminal reports due to their candid and transparent findings. This review focuses on two of these critical issues. The first critical finding of CONACED pertained to the *lack of quality of education*, which contributed to: a) low student learning achievement, b) poor preparation of teachers, c) lack of programs to prepare them, d) outdated teaching curriculum, e) lack of accessibility to basic textbooks and resources, and f) teachers' utilization of inadequate pedagogical models.

The second critical issue addressed was the *lack of equity of educational opportunities*, a result of several factors: a) lack of attention to schools and students in poor regions, b) deficiency in addressing the needs of bilingual and/or intercultural indigenous people and c) limited accessibility to and opportunities for poor students to attend pre-school and secondary schools.

These CONACED (2006) findings came a year after Panama's government officials signed two significant agreements vis-à-vis the improvement of its education system. The documents were: 1) the *Declaration of Panama on Policies of Access and Quality of Education in order to Reduce Extreme Poverty in Rural Areas of Central America*; and 2) the *Millennium Development Goal (MDG)- 2015*. Both of these programs were organized by UNESCO and supported by UNICEF.

The first document includes a number of clauses set forth to examine the educational, social, economic, cultural and political factors that hinders the opportunities of rural population living in extreme poverty conditions and with lack of access to a quality education. Overall, the document states that “poverty continues to affect the developmental potential of the region (Central America)” (Comisión Panameña de Cooperación con la UNESCO, 2005). The agreement outlined thirteen clauses addressing salient issues such as the impact of globalization in rural areas, strengthening bilingual and intercultural education in the national education systems, and integrating strategies to allow rural population to access knowledge for social and economic development; all as agendas for national education development (UNESCO, 2005).

The second document, the MDG, refers to the initial agreement of 189 countries, including Panama, to attain seven universal goals by the year 2015; the purpose of these goals purports to alleviate world poverty and secure an “Education for All.” Panama has met at least 90% of the second MDG which is to *achieve universal primary education*, however, struggles to maintain students enrolled in secondary education, particularly in rural and indigenous regions.

Despite these initiatives to improve the condition of education and the poor rural youth, their situations has not been significantly ameliorated, in proportion to all the purported programs reported to effect changes. The World Bank asserts that:

“[only] 56 percent of secondary school-age children are enrolled in schools [and] access to school is inequitable across the school-age population... In rural areas, many students who complete their primary education are unable to continue with the remaining basic grades (7-9), because there are no lower [or upper] secondary schools in their communities (World Bank, 2007, para. 1).

It is clear that without the appropriate availability of lower secondary schools, the potential for rural and indigenous youth to attend high school is dismal.

World Bank, IADB and USAID – and Panama

Since 1995, intergovernmental agencies like the World Bank, IADB, USAID and UNESCO have been involved in the development of Panama as well as in their educational system. However, the World Bank has become one of the largest investors in Panama's Education System; in 2008, they issued a \$35M loan for the *Education Quality Improvement Project (EQIP)*. The loan was intended to assist MEDUCA in addressing the salient concerns raised by CONACED in its 2006 report; 25% of the loan was said to be earmarked for secondary education (World Bank, 2008). The EQIP report confirms that while Panama currently is one of the world's upper-middle-income nations with a [then] per capita income of \$7,900, it has not been able to significantly reduce the poverty and inequality that exist, primarily since it holds one of the highest Gini index (0.561); Gini index measures the disparity in income distribution in a country; a high

index reflects higher levels of inequality. The most affected by poverty and inequality in Panama are the rural and indigenous people. As a point of note, the average Gini-coefficient for Panama between the years 1947-1995, was 0.524 (cited in Andréasson, 2002, p.6). Despite this phenomenon, Panama, along with Costa Rica are the countries in Latin America with the highest level of social spending, averaging 18% of their gross domestic product, as compared to 14% average for the rest of Latin America (World Bank, 2008). The implementation of the *Educational Quality Improvement Project*, put forth by the World Bank began in January, 2009 and is said to end December, 2013.

Theoretical Rationale for these Global Institutions

From a theoretical perspective, the involvement of organizations like the World Bank in the present and future education and economic growth of Panama and other developing countries could be interpreted as a mechanism for the globalization of educational systems. For example, postcolonial theory purports that countries previously colonized are still in one way or another under the control of their past colonizer (Spring, 2008a); that the colonization is in the form of implementation of education that pushes development of human capital skills as an economic model mostly patronized by organizations like the World Bank. Following that same notion, world systems theorists believe that there is a group of developed nations like the U.S. that exercise power over developing nations like Panama and their influence is used mainly to satisfy the needs of the inner wealthy members of developed nations (Anderson-Levitt, 2003; Spring, 2008a). For the most part, postcolonial and world systems theorists tend to overlap in their core belief (Spring, 2008a). From a sociocultural and historical perspective, postcolonial/world systems theories are closely linked to Panama due to its history as a

colonized nation-state, first by Europeans (gained independence from Spain-1821 and from La Gran Colombia-1903) and thereafter by the United States, which began with the building of the Panama Canal in 1904 and lasted through 1999 with the complete turnover of the administration of the Panama Canal to the Panamanian Government. As a result, Panama has been largely influenced by American and European societies.

Kathryn M. Anderson-Levitt (2003) refers to organizations like World Bank and UNESCO as ‘global reformers’ due to their role in implementing educational changes primarily in developing countries. Referring to the educational reform experienced in Thailand, Bowornwathana (2000, p. 393) says that:

Adopting a global reform paradigm is a good choice...because it silences domestic differences, pleases funding agencies and presents convenient packages of readymade reform programs. It is also easier to convince the public about the benefits of a reform program that has already worked well in developed countries than to build public support for a completely new indigenous reform program (cited in Anderson-Levitt, 2003, p. 29).

On the other hand, a local newspaper in Panama reported a union leader saying: “the educational reforms promoted by PREALC have failed all across Latin America because they don't relate to the real context of our countries” (Jackson, 2007, para. 8). PREALC has been criticized as being an organization that promotes prescriptions written abroad by international lenders, such as the World Bank. PREALC is a research consultant organization, said to assist developing countries like Panama to develop quality, effective and equitable education practices. Its main funding sources are Inter-

American Development Bank (IADB), United States Agency for International Development (USAID) and the Tinker Foundation, Inc.

Finally, it is clear that organizations like the World Bank, IADB and UNESCO have gained a large position of influence in the education system of Panama, particularly since most of the studies conducted on its education system come from these external organizations. Also, perhaps the paucity of academic literature on Panama's education system, except for the CONACED reports and a hand full of academic literature written by Panamanian scholars, is another indication of the agency of these global intergovernmental institutions in Panama.

Rural Development and Education in Panama and Latin America

Relationship to nature is one of the key determinants of what is rural, maybe the key determinant. Rural communities are not an artificial construct that can be laid upon the landscape like Levittown or Disney World. Rural requires a symbiotic relationship with place. Otherwise, it is urban or suburban. When rural development destroys or seriously degrades the natural environment, it destroys the core basis for "ruralness."

Karl N. Stauber

Rural Development

Rural development is associated with measures employed to improve the conditions of people living in rural areas through increase of resources such as education, health, infrastructure, capacity building for non-farming occupations and agriculture. The idea is that having access to these resources, rural people are able to enhance their living conditions in a manner that is equitable and sustainable for their social and economic well-being (FAO & UNESCO, 2003). It is estimated that 75% of the world's

poorest people who live in rural places are in developing countries; and that most engage in agricultural related trades (World Bank, 2008).

While the characteristics that define ‘rural areas’ may be similar for many countries, a universal definition of rural areas or population does not exist; it may differ based on a country, state, or region’s geographic uniqueness, or based on the purpose for which the term is applied (Amen, n.d.). However, some key components that define rural areas in most Latin American countries are distance from main cities, farming and poverty. In addition, these rural places are considered to lack appropriate tools to foment human growth due to the fact that people in rural Latin America live on limited daily resources. One definition that concisely captures the meaning of ‘rural’ for this review of literature is that offered by Richards (2004):

They [rural people] tend to live in resource poor areas, especially on hillsides and in more arid regions; in areas poorly served by infrastructure and by state human capital and public goods services (education, health, communications, public transport, electricity, etc.); and, consequently, where risk and vulnerability are highest. They are also found predominantly in the agricultural sector, with landless farm labourers the poorest occupational group in Latin America. (p.3)

Atchoarena and Gasperini (2006) estimate that the vast majority of the inhabitants of rural places in developing countries will continue to live there for another two more decades. As a result of this, “...the development challenge will continue to be related to rural trends and conditions...Poverty reduction and basic education, will require particular emphasis on rural areas” (p.35).

As noted before, one of the major characteristic of rural people around the world and certainly in Latin America is their dependence on farming as a major form of livelihood. This dependence on farming requires accessibility to capital assets, such as natural, human, social, financial and physical capital. However, productivity seems to lessen when access to one or more of these assets are not available. This low productivity of small farmers is associated with lack of access to education, land, water, and technology, amongst other issues (Richards, 2004).

Richards (2004) also posits that one way of improving small farmers' ability to increase productivity and gain access to more capital assets is by creating market linkages—diversification of agriculture—through private-public partnerships. However, to participate in these linkages, education and training is necessary and “concerns about the employability of the rural poor in more knowledge-intensive agriculture [emerges]...Hence the question: Can education and skills training make them employable?”(p. 17).

Atchoarena and Gasperini (2006) make a similar argument as Richards (2004):

Within a sustainable livelihood framework, reducing poverty does not only involve better income, it also concerns providing broader livelihood-related choices. Expanding livelihood choices involves placing greater emphasis on the interface between agriculture production and other activities. Emerging forms of diversified livelihoods contribute to spreading risk and reducing vulnerability... Vulnerability of the poor restricts their livelihood choices (p. 45).

However, Atchoarena and Gasperini (2006) caution that while there is great potential of envisioning poverty reduction through diversified livelihood strategies, the implication of adopting diverse practices need to be clearly communicated.

Rural Education in Panama and Latin America

In many Latin American countries like Panama, schools that are in *áreas de difícil acceso*—difficult to reach areas—are called *escuelas multigrado*. These are schools that serve grades 1st through 6th students in one classroom with one teacher (at times two) and they are common in rural, indigenous and some marginalized urban areas. Over the years, however, the Panamanian Government, through the Ministry of Education has launched a number of initiatives aimed at addressing the diverse geographic, socioeconomic, and infrastructural problems associated with providing educational opportunities for students in rural areas.

One such program is the *Escuelas Telebásica*, a form of distance education program that targets the rural population between ages 12 and 15. The program was established in Panama in March 1997 to provide young rural poor in difficult to access areas the opportunity to complete three years of study that correspond to the final stage of basic education (7th to 9th grade). These schools primarily use audiovisual media, such as television, to transmit educational programs that are aided by printed educational materials and tutorials on curriculum content, facilitated by a teacher.

In March of 2005 a group of six vice-ministers of education from Latin America and Panama, met with UNESCO Centro America to discuss and agree on policies to legislate access and quality of education in order to reduce extreme poverty in rural areas of Central America. There were some key considerations for an agreement made

concerning the education of rural people living in areas of extreme poverty. Among these considerations: 1) poverty continues to affect the human development potential of the [Central American] region; 2) education is a fundamental axis of the development and a human right and must be ensured with quality and equity; 3) despite efforts to significantly address the issues of education in rural areas, scourging conditions still prevail; and 4) extreme poverty particularly affects the indigenous/native populations, afro descendants and women and children of the rural zones in Central America (*Comisión Panameña de Cooperación con la UNESCO, 2005, pp. 2-3*). They also list as vital, the participation of civil societies in the planning of educational initiatives for human development in rural communities. Moreover, at this important conference held in Panama, the group of educational officials also declared that there is a “need to ...evaluate the scope of the strategies for poverty reductions, to measure the impact of the educational and social policies in the growth and well-being of the poorest sector of the population and *to favor the adoption of state policies of education and social investment* (emphasis added)” (p. 3).

Since the convening of the above meeting six years ago, the scourging conditions of rural places in Panama still exist and the adoption of educational policies to address localized issues, particularly those in rural regions, has not occurred. Earlier I posited that Richards (2004) described the characteristics of rural settings; his narrative provides the opportunity to deepen the focus on what it means to people living and working in rural places not to have policies that address localized educational concerns and/or strategies geared to afford individuals their human right to receive a quality and equitable education. For instance, rural educational regions in Panama are characterized by what

is known as *áreas de difícil acceso*.²¹ Working in areas that are remote and difficult to access can present multiple challenges and, more importantly, can be a dangerous endeavor for teachers, students and families. As described by Jackson (2009), reporting on an incident:

Teaching in remote areas that are not served by roads is a dangerous occupation and Dominguez [a teacher who worked in an indigenous village] was far from the first AEVE [teacher union organization] member to drown while crossing a river going to or coming from work. Some of the organization's members have also lost children to the special hazards of teaching in the roadless wilderness. The last incident was in 2007²², when teacher Doris Dixon, her son and a family friend were drowned not far from the scene of the latest death. The union has been agitating for a series of safety measures for years, *but it has been a long time since Panama has had a government that takes public school teachers seriously and there has been little progress* (emphasis added).

AEVE buried their dead colleague and then an assembly of 400 rural teachers demanded a meeting with Molinar [newly appointed—2009—Minister of Education] to discuss a list of 15 demands concerning teachers serving in the officially designated "areas of difficult access" (Jackson, 2009, para. 4).

²¹ Areas of difficult access or schools located in remote areas.

²²In May 2007, two teachers, along with their six-year old son, met their deaths crossing a river in the province of Veraguas. The river suddenly began to rise and dragged them midstream with little opportunity to be saved. A male teacher who witnessed this awful event barely managed to save his own life by spending the night hanging on a branch of a tree. He will forever be traumatized by this event and his powerlessness in not being able to help them. These teachers, like many others, were returning to their assigned schools on Sunday afternoon, making their regular commute. The commute consisted of a four-hour trek that included cutting across the infamous river to get to their rural school, which serves mostly the indigenous population. <http://biblioteca.prensa.com/contenido/2007/05/22/22-10a-nota2.html>

Lack of infrastructure and lack of access to educational opportunities in difficult to reach areas are major factors influencing the opportunities for rural youth to receive quality and equitable education (CONACED, 2006). It is also a major reason for teacher-turnover in Panama. The tragic—repeated—incidents described above speaks to the staggering labor that teachers not only in Panama, but also in so many parts of the world must endure to ensure that education reaches the disenfranchised.

MEDUCA assigns teachers to school sites, and assignments cannot be changed until an opportunity for a permanent position in a school of preference opens; this is also based on seniority. Travel distances from one geographical region to another can take anywhere between eight to sixteen hours roundtrip. In the rural region of Darién, on the eastern side of Panama, due to the sparsely populated townships and means of transportation, it could take a whole day to get from one destination to another.

Rendón and Wachtenheim (2002) point out that scarcity of schools, along with lack of teachers, school supplies and poor infrastructure, are some of the reasons why rural adolescents, as a whole do not attend school. Because of sparsely populated rural areas, “the relationship of distance and schooling is particularly critical in rural areas, where children must walk long distances to widely disperse schools and must travel additional distances to nearby urban areas for higher primary grades” (Vasconcellos, 1997, p.127). As such, Rendón and Wachtenheim (2002) reveals that rural adolescents from Latin America either stop attending school to seek employment or attend school while working part time due to socio-economic circumstances. Their study reveals that without improved living conditions for rural families in Latin America, particularly the

indigenous population, education achievement of rural adolescents and future offspring will continue on a downward slope.

As previously noted, the World Bank has been systematically involved in the education system of Panama. Its 2009-2014 Education Quality Improvement Project (EQIP) for Panama report lists 10 reasons why adolescents drop out of school or do not transition into secondary school. Table 1 below reflects descriptive data obtained from the EQIP report.

Table 16: Comparative Reasons for Non-Poor/Poor Not Attending Secondary School (*)

Description	National	Non-Poor	All Poor	Extreme Poor
Age	1.9	0.0	2.5	1.8
Lack of Money	42.7	28.9	46.7	51.0
Work	8.7	15.5	6.6	6.8
Domestic duties	5.0	1.4	6.1	7.4
Finished studies	0.1	0.0	0.1	0.2
Not interested	19.4	19.0	19.5	17.1
Sickness/Pregnancy	6.3	10.2	5.1	5.1
Distance/Transport	0.5	1.2	0.4	0.2
Quality issues	6.5	11.6	5.0	2.9
Other	8.9	12.2	7.9	7.5
Total	100.0	100.0	100.0	100.0

Note: Data in this table was obtained from WB's EQIP, Report No. 43757-PA, Table 2.4.

(*)Values are in Percentage

Interestingly enough, the above table, concerning the impact of geography and infrastructure on school attendance strongly contradicts Vasconcellos (1997); it shows that *distance/transport* is not a strong reason given for not-attending secondary school. However, *lack of money*, 46.7% and 51%, amongst the *all poor* and *extreme poor*,

respectively is a strong mediating factor for all other variable. The World Bank's report states that "even if schools were evenly distributed across the country, many of the poor and the extreme poor would still not attend [school] due to the cost of tuition and materials, and lack of interest which is likely caused by the low quality of teaching" (World Bank, 2008, p.43). In Panama, and most developing countries in Latin America, families in rural and indigenous communities finance their children's education (Rendón and Wachtenheim, 2002), which has implications for lack of schooling.

The rationale for my study indicates that socioeconomic conditions, geographic location and lack of adequate infrastructure were some conditions that created disparities in the access to educational opportunities for students in secondary school in the region of Darién, one of the poorest provinces of Panama. The "lack of money" as a reason for not attending secondary school as addressed in Table 1 speaks directly to the socioeconomic condition of the students and residents of Darién.

Rendón and Wachtenheim (2002) conclude that:

...rural families often have to self-finance any investments including those in human capital. The opportunity costs to rural households of sending their children to school can therefore be quite high and in many cases prohibitive.

This is especially true for agricultural families during harvest season (p. 25).

As a result, work often seems more cost productive than school, hence reducing the potential for human capital growth.

Economic inequality amongst rural people in Central America is strongly linked to the lack of human capital. Data from a survey conducted by the World Bank in Honduras, Nicaragua, Panama and Guatemala revealed that "human capital differences

explained 13% of rural inequality; social capital explained 6.7%; and natural capital 6.3%” (cited in Richards 2004, p.12)²³.

Rural Education has become an important focus on the global agenda of rural development. This is especially true for institutions like the World Bank (WB), IADB, UNESCO, Food and Agricultural Organization (FAO) and many others, that seem to view education as one of the primarily component to increase human capital, and as a result improve livelihood.

World Bank has stated that “in terms of completion at the secondary level [in Panama] only 35 percent of those living in rural areas and 10 percent of the indigenous peoples have completed this level vis-à-vis 60 percent of those living in urban areas” (World Bank, n.d.). As a result, in 2007, the World Bank announced its intention of making \$5.1M available to improve the secondary education system in impoverished areas of Panama, mainly in indigenous regions, to ameliorate the stark inequalities that exist in the distribution of educational opportunities at the secondary level in Panama. Specific information as to where and how the funds were assigned was not readily available.

One of the main propositions of the World Bank is that education represents the opportunity to have more people with the human capital necessary to fulfil the needs of the global markets which are now impacting rural places in the form of service and trade businesses (e.g. ecotourism business, environmental conservation and investments in natural resources). The ultimate goal of an increase human capital is high productivity,

²³ Human capital refers to the knowledge, skills, and experience of people that make them economically productive.

Social capital is defined as shared bonds and network that identifies a group or community (World Bank, n.d.).

Natural capital is "a stock that yields a flow of valuable goods or services [e.g. ecosystem] into the future" (Costanza, 2008).

which is said to produce more economic growth for countries and individuals with investment power. For the FAO, education is the means by which more people in rural places obtain the skills and training necessary to secure their sustenance, particularly in the agricultural field, to participate in the rural development and sustainable futures for their families and their communities.

What does not seem too transparent in the push for the increase of human capital through the education of rural people is the relationship between increased human capital and the allocation of potential employment opportunities in the rural places where the education occurs. Corbett (2007) asserts that there is a “complex relationship that exists between rural education and the sustainability of rural community” (p.1). He proposes that while education increases human capital, the increase does not necessarily result in an increase in or improvement of the socioeconomic conditions of rural communities. His argument is based on several tenets; one of is that formal education is directly linked to a growing disconnect to rural places, and as a result outward migration from rural places. He concludes that “formal education is designed for those who leave” (p.1).

If Corbett (2007) is correct in his assertion, and migration occurs, how exactly would human capital gained through formal education of rural youth meet the socioeconomic need of rural people without draining the human capital that is essential for the sustained development of rural communities. Stauber (2001) suggests that one possible way is to restructure tertiary institutions that are in sparsely inhabited areas with extreme poverty. By offering careers that are useful and of interest, youths would be less inclined to leave their rural communities.

The Role of Place-Based Education

Place-based education as a theoretical frame facilitates the understanding of the relationship between a school's curriculum and its significance to the context or the place where the school is located. It also serves as a guide to understand school members' philosophical assumptions on learning.

The Rural Schools and Community Trust (2000) says that a pedagogy of place brings school and community together on a common pathway dedicated to stewardship and life-long learning. It is teaching by using one's landscape, family, and community surroundings as the educational foundation. Significant learning takes place outdoors and in the community. This community expands outward from the local landscape and home, to regional realities, to international issues... (p.2).

Place-based education (PBE) is not necessarily a new concept; terms such as experiential, learning, project-based learning, place-conscious pedagogy, integrated curriculum, service learning, hands-on, context-based or outdoor learning, are all considered a form of place-based education (Gruenewald, 2003a). While place-based education as a learning method can be applied in any environment, that is urban, suburban or rural, scholars in the field of rural education have argued that the education in rural regions needs to be place-based. Expanding on this concept of place-based education, Vandenbosch (n.d.) explains that

contextualisation of learning occurs when the content of the curriculum, and the methods and materials associated with it, are related directly to the experience and environment of the learner. In many schools in developing countries, most

learners have direct experience of natural resources, either as a result of their own activities, or from observation in their immediate surroundings (p. 2).

The idea of place-based education offers a variety of perspectives that allow school faculty and staff, students and their families to think of their schools and environment as “places that are *profoundly pedagogical*...” (Gruenewald, 2003, p. 621). This concept is based on the belief that places and culture are synergistically related, but that relationship has been somewhat overshadowed by an education system that dismisses its connection; “that is, schooling often distracts our attention from, and distorts our response to, the actual contexts of our own lived [places]” (p. 623). Gruenewald (2003) posits that schools should be more actively engaged in providing more meaning to the role of place in the education. Interestingly enough a similar proposition was echoed by rural sociologist, Ofelia Hooper during the early twentieth century, after conducting a research on *The Plight of Education in Rural Panama*. She explains that, “if the Panamanian school system is to be effective for the greater bulk of rural population, its methods must be revised to meet the daily needs of the farmers...education should fit children to live successfully in the environment to which their birth has destined them” (Hooper, 1944, p.1).

As purported by Vandenbosch (n.d.) a PBE implementation in developing countries brings into the foreground the relevance of the students’ every-day experiences with the natural environment. Hence, adopting a PBE approach to learning should also take into consideration the subjective “sense of place” that the learner brings into the school. In this regard, Joel Spring (2008b), referring to cultural differences and schooling, states that “students from different cultures have differing ways of seeing,

knowing, and interrelating with knowledge and classroom activities” (p.3).

Consequently, the interconnection between students and *place* could result in different knowledge construction on PBE in ways that are meaningful to students’ learning.

It is important to note that the meaning of PBE can take on different forms based on learners’ subjective “sense of place” and differing exposure to [an ecological] place. For instance, a student from an urban region when exposed to ecologically rural places, can gain a consciousness of the value of those places, their beauty and their natural resources; ultimately those students would learn and understand why it is important to preserve the natural habitat, but often without considering the relationship with and the different meanings that those same ecological places have for the people living in those rural places. In this regard, John Cameron (2008) writes: “to what extent am I using place as a vehicle for developing human responsiveness in general, rather than being concerned for the qualities and well-being of the place itself? In other words, is the form of place-based education I teach more anthropocentric or ecocentric?”²⁴ (p.297).

Hence, the interconnection between people, communities, culture, and resources that can be derived from place, is crucial in thinking about what place represents for the students when teaching a lesson from a PBE curriculum. As such, I purport that the benefits that can be obtained from place as a construct for rural learning, particularly in developing countries, can only be attained based on the intraconnection that the community members experience with their place, that is, how they think of place.

²⁴ Anthropocentrism considers humans to be the most important life form, and other forms of life to be important only to the extent that they affect humans or can be useful to humans. In an anthropocentric ethic, nature has moral consideration because degrading or preserving nature can in turn harm or benefit humans.

[For] ecocentric all life has intrinsic value... In an ecocentric ethic nature has moral consideration because it has intrinsic value, value aside from its usefulness to humans. Using this ethic, for example, one could judge that it would be wrong to cut down the rainforests because it would cause the extinction of many plant and animal species.

Knowledge construction, which is highly subjective, is based on their relationship to their surroundings—they learn how to access and use local resources to meet their day-to-day needs. Each member of place internalizes their meaning of place based and the role of the natural resources in these places has in securing their well-being and that of their family.

In summary, place-based education is intended for all participants in a given community to gain a better understanding of their place; that understanding is grounded in the building of sustained socioeconomic growth for the students, their environment and their communities, through an enriched integrated curriculum that is rooted in what is local. Figure 1 in the next section of this literature review provides a sample contextualized curriculum on agroforestry that also pertains to the context and content of the study.

The Role of Agroforestry Systems

The word agroforestry is not a new term, however it was not until the mid 1970s that it returned to the scene with a more ample definition beyond the meaning of the two words combined. According to the *Journal of Agroforestry Systems* (1982),

agroforestry is an interdisciplinary approach to systems of land use. It implies an awareness of interactions and feedback between man and environment, between demand and available resources in a given area which—under certain conditions—require optimization and sustained management rather than ever-increasing exploitation. Hence, agroforestry as a science involves not only the interrelation of forestry and agriculture, but also of livestock and more

technologically advanced land usage systems such as aquaculture and fisheries and making use of appropriate land resources (Agroforestry Systems, 1982, p.1).

D.P. Garrity (2004) addresses a number of salient positions relating to the importance of agroforestry in attaining the United Nations Millennium Development Goals (MDG), particularly, goal 1) *eradication of extreme poverty and hunger* and goal 7) *ensure environmental sustainability*, by 2015. He states:

The potential of agroforestry to rehabilitate degraded land, and to conserve soil and water on the working lands of the tropics, has long been recognized...

Collective action through community-level support for soil and water conservation is crucial to the timely application of agroforestry-based soil and water conservation over whole landscapes... Unfortunately, too little research attention has been given to how the successful agroforest[ry] systems observed in some parts of the tropics can be more widely expanded for the benefit of the smallholders living in remote areas with poor market infrastructure.

Agroforestry research and development must now seriously focus on land management interventions that reach the poorest and most vulnerable land users (p.9).

Agroforestry is largely characterized as a land system that deliberately grows woody perennials in the same management unit (ground) as annual crops or animals, either sequentially or simultaneously (Fischer and Vasseur, 2000). One of the main benefits of using this method is that it not only increases, but broadens the agricultural production, which improves the standard of living of rural farmers, and sustains natural

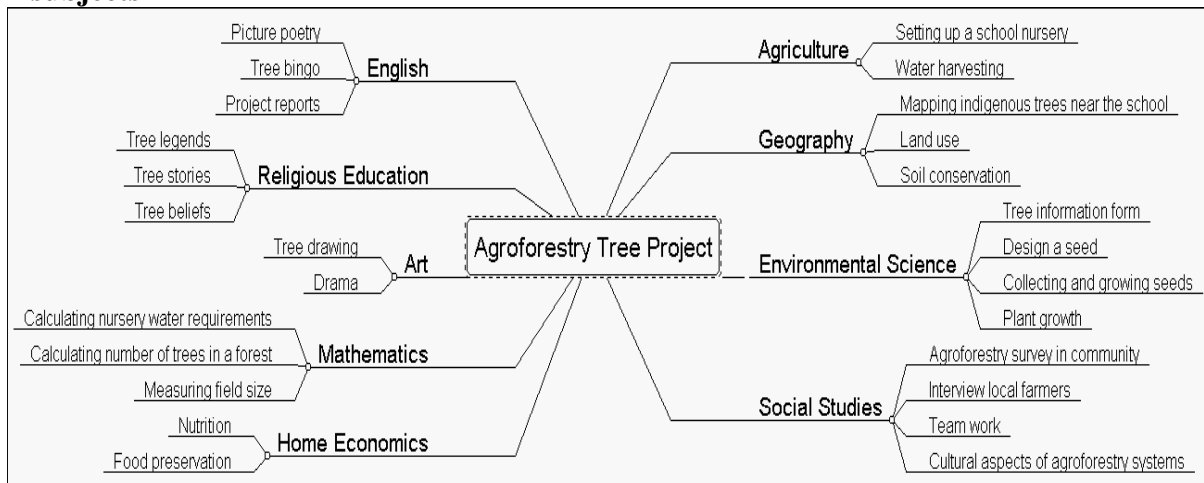
resources—soil and water—necessary for continuous agricultural production (Fischer and Vasseur, 2000).

Residents of rural areas such as Darién, Panama, primarily gain their sustenance by farming, fishing, and growing livestock; most, using traditional methods of farming and raising cattle. However, utilizing agroforestry as a system of land management can provide many environmental benefits such as increased soil fertility, reduced soil erosion, and reduced surface runoff (Fischer and Vasseur, 2000). Using traditional methods that separates the combined practice of agriculture and forestry can bring a variety of problems. For instance, shifting cultivation systems contribute to environmental and socio-economic problems. Shifting cultivation occurs when smallholders reuse a land before giving it enough time to renew its natural resources. This occurs through land deforestation and/or usage of the land by cattle ranchers. The land soon becomes unproductive due to erosions and sedimentation of watersheds. Agroforestry systems are associated with more intensive use of land than shifting cultivation systems and can therefore contribute to the reduction of deforestation (Fischer and Vasseur, 2000).

To reduce the impact of adverse agricultural practices, Garrity (2004) addresses the importance of building capacity and strengthening educational institutions with tertiary agroforestry programs. However, referring to the Millennium Development Goal number two, *achieving universal primary education*, he makes it clear that education is a compelling weapon against poverty and that it is essential to put into practice tools that combine issues of education, food and health in rural schools, as together, they serve to promote the incorporation of agroforestry and natural resource management, and help to enhance its relevance to rural youth.

Garrity (2004) provides evidence that youth in rural communities, who are afforded an opportunity to an agroforestry secondary education can potentially be agents of change in their communities. Nevertheless, as Garrity (2004) points out, “more comprehensive and active international networks are needed in the coming decade to facilitate the flow of the *best varieties and flow of knowledge* (italic added) of how... species—referring to types of trees for timber and crops that are underexploited and underutilized—may contribute new or expanded enterprise opportunities” (p. 12).

Figure 1: A local agroforestry tree project to integrate the objectives of many subjects



Note: Reprinted from “Contextualising learning in primary and secondary schools using natural resources” by T. Vandenbosch, 2007, P. 3, Farmers of the Future World Agroforestry Centre Agroforestry, page3.

Tom Vandenbosch (2007) notes that education that is contextualized using agriculture or environmental subject matters will assist students in mastering academic skills in other areas because “agriculture and the local environment can be the basis of integrated projects incorporated in the school curriculum” (p.2). Figure 1 above provides an excellent example of what the contextualization of an agroforestry curriculum could look like in a classroom. He identifies how each subject is interconnected to the main theme of an agroforestry tree project. A curriculum that is place-based in nature is

scaffolded in an authentic setting and how it contributes to the holistic development of youth learning such curriculum is the essence of this research study.

Conclusion

This literature review provided the conceptual framework necessary to guide this study in answering my research questions: *In what way can a school with an agroforestry curriculum contribute to the sustainable development of youth in an area of extreme poverty of Panama?*

The Panama education frame provided a general understanding of the past and current conditions its education system. Rural Development and Education of Panama and Latin America presented information to understand the social and economic conditions that influence the education of rural youth. Place-based Education and Agroforestry Systems serve to explain how the synergy of these two theoretical stances work together in facilitating the understanding of what contributes to the sustainable development of the youth—mainly positive changes in their social and economic conditions and their interest preserving their ecosystem as change agents in their communities.

**COLEGIO AGROFORESTAL DE DARIEN (CAFD) -
FORMER STUDENTS SURVEY**

Student ID: _____ Year Graduated from IFAD: 2007 2008 2009 Age: _____

Home Community: _____ Borough: _____ District: _____

Ethnicity: Afro-Latino Emberá Gender: Male Status: Single
 Colono-Latino Kuna Yala Female Married
 Emberá-Wounaan Other Other

Are you currently working: Yes, if yes, in what field No

Occupation Field: Agriculture Forestry Fishing Livestock Other _____

If you answered No, have you worked in Darien since you graduated? Yes. How long _____ No

Where are you working? In Darien In another region. If another region which one? _____

Family Size: _____ Family income: \$ _____ Two-weeks Monthly Daily Other: _____

Where did you attend middle school? _____ When completed? ____/____/____

How well do you feel IFAD prepared you for the world of work in the above occupational fields?

Very well adequately well somewhat well Not well prepared Not applicable to my job

Are you currently attending college: Yes No. If yes, where are you attending? _____

What type of career are you pursuing: _____

If no, have you attended college since graduating from IFAD: Yes No

If yes, where: _____ For how long: _____

What were you studying: _____

How do you define sustainable development: _____

**COLEGIO AGROFORESTAL DE DARIEN (CAFD) -
ENCUESTA PARA GRADUADOS**

ID: _____ Año de graduación del IFAD: 2007 2008 2009 Edad: _____

Corregimiento: _____ Lugar Poblado: _____ Distrito: _____

Etnia: Afro Latino Emberá-Wounaan Género: Masculino Estado Civil:
 Colono/Latino Kuna Yala Femenino Soltero(a)
 Emberá Otro Casado(a)
 Otro

Está trabajando actualmente Sí No. **Sí contento Sí.** En que campo? Durante que tiempo: _____

Campo ocupacional: Agricultura Forestaría Pesca Ganadería Otro: _____

Donde está trabajando? En Darién En otra provincia. En que provincia: _____

Si contesto No, ha trabajado alguna vez en Darién desde que se graduó Si No

Si contesto si, por cuanto tiempo _____

Tamaño de la Familia: _____ Ingreso: \$ _____ Quincena Mensual Diario Otro: _____

Dónde hizo el primer ciclo de secundaria: _____ Fecha de graduación: ___/___/___

Que tan bien piensa usted que la educación en IFAD le ha preparado para trabajar las áreas ocupacionales?

Muy bien Adecuadamente bien moderadamente bien No tan bien No aplica

Esta actualmente en la universidad: Sí No. Si, contestó Sí, donde? _____

Qué carrera está estudiando _____

Si contesto No, ha asistido a la Universidad desde que se graduó de IFAD: Sí No

Donde: _____ Durante que tiempo: _____

Que estudiaba: _____

Como define usted desarrollo sostenible: _____

**COLEGIO AGROFORESTAL DE DARIEN (CAFD) -
CURRENT STUDENTS SURVEY**

Student ID: _____ Grade: _____ Age: _____

Home Community: _____ Borough: _____ District: _____

Ethnicity: Afro Latino Emberá-Wounaan Gender: Male
 Colono/Latino Kuna Yala Female
 Emberá Other

Parents/Family Occupation: Agriculture Forestry Fishing Livestock Other: _____

Family Size: _____ Family income: \$ _____ Two-weeks Monthly Daily Other: _____

Where did you attend middle school? _____ When completed? ____/____/____

FUTURE EDUCATION AND/OR OCCUPATION PLANS:

Do you plan to attend college Yes No. If yes, what do you plan to study? _____

What type of occupation do you plan to pursue: _____

How good do you feel is the education at IFAD preparing you for your future occupation?

Very good adequately good somewhat good Not good Not applicable to what I want to do

What are your favorite subjects: _____



How do you define sustainable development:



IMMEDIATE PLANS:

What do you plan to do right after graduation?

Work in Darien Move out of Darien Other: _____

How will you fulfill this plan?

QUESTIONS FOR CURRENT STUDENTS

1. What made you decide to attend IFAD?
2. Where do you live? How long does it take to get to school? Of often do you go home?
3. What other options for completing secondary school did you have?
4. Tell me about the agroforestry curriculum;
 - a. What courses do you enjoy the most? Why?
 - b. What courses do you enjoy the least? Why?
5. If you could, what would you change about the curriculum?
6. How do you feel the education you receive at IFAD will contribute to your future?
7. What are some traditional knowledge about agroforestry systems you came with
 - a. Forestry
 - b. Agriculture
 - c. Fishery
 - d. Livestock
8. Have these ways of thinking change? If so how and why?
9. Have you been able to apply any of what you have learned at home or in your community? If so, how?
10. What comes to mind when you hear the phrase sustainable development
 - a. What does it mean to live sustainably?
11. Do you know any of the former students of IFAD?
 - a. Do you know where they are now?
 - b. Are they working;
 - c. Are they living in Darién?
12. What are your plans after graduation?

QUESTIONS FOR FORMER STUDENTS

1. What made you decide to attend IFAD?
2. Where do you currently live?
3. Are you currently working? If yes, where?
 - a. If no, have you worked at all since you graduate? If yes, where
 - b. If no, why not?
4. Have you been able to apply any of what you have learned at IFAD at home or in your community? If so, how?
5. Do you feel the education you received at IFAD contributed to your well-being; your sustainable development?
 - a. How?
6. What comes to mind when you hear the phrase sustainable development
 - a. What does it mean to live sustainably?
7. Do you keep in contact with any of your former peers?
8. Do you know where they are now?
 - a. Are they working;
 - b. Are they living in Darién?
9. What are some of your future plans?

QUESTIONS FOR TEACHERS

1. How long have you worked at IFAD?
2. Are you from the region of Darién? If not what region?
3. What subject do you teach at IFAD?
4. Is it your main/license subject area?
5. How long have you been teaching this subject?
6. How did you come to teach at IFAD?
7. What are some of your thoughts about the agroforestry curriculum?
 - a. How does your subject connect to this concept
 - b. Do you feel the curriculum responds to the educational needs of the youth of Darién?
 - c. What do you feel is the most effective aspect of the curriculum?
 - d. What aspects of the curriculum would you change? Why?
8. How do you think it contributes or will contribute to the students' well-being?
9. Do you know any of the former students that are currently working in the field of agroforestry? If so, tell me about them.
 - a. What area of agroforestry
 - b. Do you know how to reach this/these student(s)
 - c. Are the students still living in
10. Are there any students that you know are working but not in other occupational fields
 - a. What field? Do you know how to reach them?
11. How prepared to be gainfully employed do you feel are the students when they graduate from IFAD?
 - a. One being least prepared
 - b. Five being the most prepared
12. Where are the jobs in Darién for the youth graduating from IFAD?
13. Generally speaking, what do you think contributes the most to the sustainable development of the youth of Darién?

QUESTIONS FOR PRINCIPAL

1. How long have you been the principal at IFAD
2. Are you from the Darién region? If not, from what region
3. In what ways you believe the curriculum will contribute to the well-being of the youth of Darién?
4. Based on the curriculum, what jobs are students being prepared for?
 - a. Where are these jobs?
5. Is the school affiliated with organizations/businesses that assist students in obtaining jobs in the field of agroforestry? If so,
 - a. Who are these organizations/businesses?
6. What are some outcomes you expect from students?
7. Where are the graduates?
 - a. Do you know how many are working
 - b. Do you know how many have continued their education
 - c. Or how many are doing both
8. What would be the best way to locate them?
9. What would you say is the impact of IFAD in the Darién Region?

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²⁵ CONACED is the National Council for Education - Consejo Nacional de Educación.

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