

Martina Bustos: PROJECT TRANSITION

A Sustainability Blueprint for Community Development



The Sustainability
Laboratory



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1 Introduction

In our world today, we face a variety of complex and interrelated sustainability challenges that threaten our very survival. Humans have damaged the exquisite equilibrium that provides for life on Earth, and the consequences are already being felt in a variety of severe ecological, social and economic hardships. These issues underscore the need to question dominant perspectives on the alignment of our systems, as well as the need for bold, new experimentation with approaches to sustainable development.

In June 2014, a group of international students and professionals convened in Costa Rica for the first pilot session of the Global Sustainability Fellows Program, hosted by EARTH University. This innovative, graduate-level program was developed by The Sustainability Laboratory in order to better prepare future generations of leaders in government, business and civil society to effectively tackle the sustainability challenge by imparting an essential set of core competencies required for the task. As a part of this program, participants began meeting with members of the Martina Bustos community in the Guanacaste region of Costa Rica, initiating a process of community appraisal. They found a community marked by seemingly intractable social, economic, civic and environmental problems.

In August 2015, The Sustainability Laboratory returned to Guanacaste with a select group of Global Sustainability Fellows and representatives from EARTH University in order to work with members of Martina Bustos to create a blueprint for community development. Throughout the project, the Fellows performed a regional and community diagnostic and generated a detailed multidisciplinary database. Fellows also facilitated in-depth dialogue sessions with the community in which members envisioned their future and identified critical issues facing the community, using systems-thinking content and tools. The collaborative creation of several System Dynamics models helped Fellows and community members alike to understand the interrelated nature of Martina Bustos's diverse challenges, and to focus on holistic, rather than partial, solutions. The community members and Fellows identified key leverage points and development strategies, which were presented to the community at large as "recommendations toward a sustainable future."

The Martina Bustos Community, At a Glance

The property of Martina Bustos is located 4 km northeast of the City of Liberia, the capital of Guanacaste province, Costa Rica. Twenty-five years ago the property, 23 hectares of limestone land, was offered by private landowners to a group of economic refugees and migrants fleeing regional challenges. To this day, ownership status and land titles remain unsettled. The community has approximately 1,743 residents (Census 2015), 60% of whom are Nicaraguan migrants, with varying levels of vulnerability due to their migrant status. The community is plagued by a host of interrelated issues, including lack of property rights; lack of access to clean drinking water, sanitation, and health care; poor housing; and lack of proper waste management, all of which have a deleterious effect on the health and living conditions of inhabitants. These issues are exacerbated by insufficient transportation options, and limited access to education. Although individuals, non-governmental organizations, and civic organizations have implemented various initiatives aiming to improve conditions in Martina Bustos, there have yet to be any comprehensive coordinated efforts that take a structural view towards realizing a sustainable future.

The intention of this project document is to demonstrate an integrated approach to sustainable community development in Martina Bustos, incorporating diverse, globally-relevant issues including migration, environmental degradation, community empowerment, and other economic, social and civic challenges, in order to model leading-edge, alternative methods for community transitions toward sustainability. Those who participated in the important work of creating this project document include:

- The Martina Bustos Development Association, along with passionate and committed members of the Martina Bustos community
- The Sustainability Laboratory, a US-based non-profit working to address urgent sustainability challenges facing the planet by creating and demonstrating effective tools for catalyzing significant, positive change
- Fellows from The Lab's Global Sustainability Fellows Program (GSF), a graduate-level learning experience designed to inspire and mobilize future leaders from all sectors of society and prepare them to effectively address local, regional, and planetary sustainability challenges
- EARTH University, established in 1990 in the Caribbean lowlands of Costa Rica as a private, non-profit, international institution dedicated to agricultural sciences,

natural resource management, scientific and technological education, and sustainability.

Project Transition: A Sustainability Blueprint for Community Development

The basis for development outlined in this project document follows the **Project Transition** model, a Sustainability Laboratory signature approach, which integrates:

- 1) A comprehensive systems approach and a system-oriented design strategy, which provide a holistic methodology for addressing significant global issues, guiding project planning, and facilitating development processes.
- 2) The Lab' s Five Core Principles of Sustainability, which provide an essential roadmap for developing model sustainability practices. These principles are expressed in relation to five domains:
 - The **Material Domain**, which constitutes the basis for regulating the flow of the materials and energy that underlie existence.
 - The **Economic Domain**, which provides a guiding framework for creating and managing wealth.
 - The **Domain of Life**, which provides the basis for appropriate behavior in the biosphere.
 - The **Social Domain**, which provides the basis for social interactions.
 - The **Spiritual Domain**, which identifies the necessary attitudinal orientation and provides the basis for a universal code of ethics.

2 Community Vision of the Future



Images 1 and 2: Members of the Martina Bustos community participating in the visioning process

By participating in dialogue, reflection, and collaborative processes facilitated by the Global Sustainability Fellows, community members created the following community vision:

Members of Martina Bustos envision a future in which their community has been transformed into a regional model for development, fulfilling their dream of unity, prosperity, and joy through their actions. In this envisioned future, all community members—youth, adults, the elderly, and those of different social classes—live in harmony, enjoy equal access to education, and work together to meet their basic needs and foster equality, equity, and dignity. Members of the community transforming their hopes into action through hard work and resourcefulness become an example of community empowerment for all Costa Rica.

Furthermore, community members foresee:

- Access to modern infrastructure, including: well-maintained roads and bike lanes, comfortable public transportation, eco-efficient homes, public parks, as well as reliable access to water and electricity. Members of the community will use their resources wisely, converting waste into resources. The community will be safe, organized, clean, and green—an ecological community that shares its experience and practical knowledge with other communities.
- A community in which its members have achieved financial independence and all members are active contributors to Costa Rican society. Through a variety of

community enterprises, community members will have developed their own revenue-generating activities, including: a recycling center; sports fields and recreational areas; ecotourism and cultural events; mechanical workshops; livestock, dairy, and fishery operations; home vegetable gardens; and an artisanal craft and food market offering the delicacies of the Central American region.

- A multipurpose community center that includes health care services, neighborhood police, a kindergarten, primary school, and secondary school, as well as a craft center. Additionally, community members envision the founding of a technical college through which members acquire and strengthen their professional capacities and empower other communities in their own transition towards sustainability.

Martina Bustos is recognized as one of the most inspiring communities in the Guanacaste region, receiving visitors from all over Costa Rica as well as other countries. Members of the community motivate youth and the elderly to develop their capacities as leaders in the transition toward sustainability, and to offer their experience, their respect for life, their productivity, and the example of their vibrant community as a contribution to future generations, a sustainable Costa Rica and a better world.

3 Community Life and Critical Issues

3.1 Aspects of Life in the Marina Bustos Community

A comprehensive data collection effort along with extensive discussion with members of the Martina Bustos Community (included in full in the Appendix) resulted in the identification and elaboration of the following features of community life:



Image 3. Overall view of the project site

Location and Climate

The Martina Bustos (MB) community is located in the northwest of Costa Rica, in the province of Guanacaste. One hundred kilometers (100km) separate Martina Bustos from the international border with Nicaragua. MB was formed more than 25 years ago on private property held by Jose Joaquín Muñoz Bustos (Resource D). It is part of Liberia's canton, which is the principal city of the Guanacaste province.

MB shares Guanacaste's predominantly dry tropical climate. Details concerning temperature and rainfall patterns can be seen in Table 1, below.

Month	Average temperature				Total average rain (mm)	Average days with rain
	°C		°F			
	Min	Max	Min	Max		
Jan	20.7	33.4	69.3	92.1	1.3	0
Feb	21.2	34.4	70.2	93.9	1.7	0
Mar	21.6	35.4	70.9	95.7	4.2	0
Apr	22.7	35.9	72.9	96.6	24.7	2
May	23.4	33.9	74.1	93.0	198.4	12
Jun	23.2	32.0	73.8	89.6	247.4	18
Jul	22.8	32.1	73.0	89.8	157.3	14
Aug	22.6	32.1	72.7	89.8	210.9	16
Sep	22.4	31.3	72.3	88.3	360.5	21
Oct	22.3	30.9	72.1	87.6	327.1	20
Nov	21.5	31.6	70.7	88.9	102.4	9
Dec	21.0	32.5	69.8	90.5	10.9	3

Table 1: Climatological data for Liberia over the last 10 years (IMN, 2015)

The data in Table 1 represents the average of 10 years of recorded climatology information and does not represent the specific climatology of the last three years. In the last three years, Guanacaste has suffered from pronounced drought, which has not been seen in the area since 1937 (La Nacion News, 2015; CR Hoy News, 2015).

2013 registers show the complete lack of rainfall in July, making Liberia the regional location with the most serious drought. By the 1st of June, 2015, meteorological stations reported just 1.3mm of rain. This resulted in serious losses at sugarcane plantations and cattle ranches in Guanacaste, with severe financial repercussions for those in the industries (La Nacion News, 2015; CR Hoy News, 2015).

Geology and Soil Properties

Martina Bustos is built upon a rocky albite mineral deposit/compressed sandy-clay entisol lookalike. The limestone potential is currently being studied by EARTH University as a potential silicon fertilizer for monocotyledoneous plants (e.g. corn, wheat, oats, vanilla orchid, coconut palm, banana, ginger, onion, garlic, pineapple, asparagus, barely, millet, rye, rice, and taro), which would make them more pest-resistant.

Compound	% in Calcined sample	% in Fresh sample
Silicic dioxide	74.40	70.83
Aluminum oxide	16.98	16.16
Iron oxide	1.81	1.72
Calcium oxide	0.61	0.58
Magnesium oxide	0.18	0.17
Sodium oxide	1.59	1.51
Potassium oxide	3.80	3.62
Titanium oxide	0.29	0.28
Manganese oxide	0.06	0.06
Phosphorus pentoxide	0.02	0.02
Strontium oxide	0.02	0.02
Barium oxide	0.21	0.20
Sulfur trioxide	0.01	0.01
Humidity		1.16

Table 2: Chemical composition of deep undersoil in Martina Bustos (Varela and Velásquez, 2014)

Studies by Varela and Velasquez (2014) concluded that MB's soil has low nutritional content for agronomic establishment if used alone as a substrate. This may be true thus far, however an appropriate biochemical environment for plant life could emerge with time with correct composting and other soil-enhancement techniques.



Image 4. Martina Bustos's soil

Infrastructure and Access to Services

Lack of water access is one of the main issues reported by community members. This problem stems mainly from MB residents' lack of property titles, which is a primary condition for gaining a legal and viable pathway to granting the installation of water service to private homes. Without property titles, it is impossible to segregate bill charges by household, as the whole property falls under just one property title.

In 2008, a water tap was installed in the western part of the community, beginning at the west side of the red line in Image 6. MB residents walk from their homes to these public water taps to fill their containers for domestic use. Between 2008 and 2009, the government installed approximately 8 to 10 water taps along the main street.



Image 5: Means of water access in MB

Image 6 illustrates the location of eight formal water taps (yellow icons) and nine informal water taps. Water is distributed as follows: groundwater is collected from a pump well located in Nazareth (a community to the west, at the beginning of the red line in Image 6) and sent to a container located at the Y icon in Image 6 (a higher point in the community). Pressure and gravity determines the amount of water released from the different water taps.

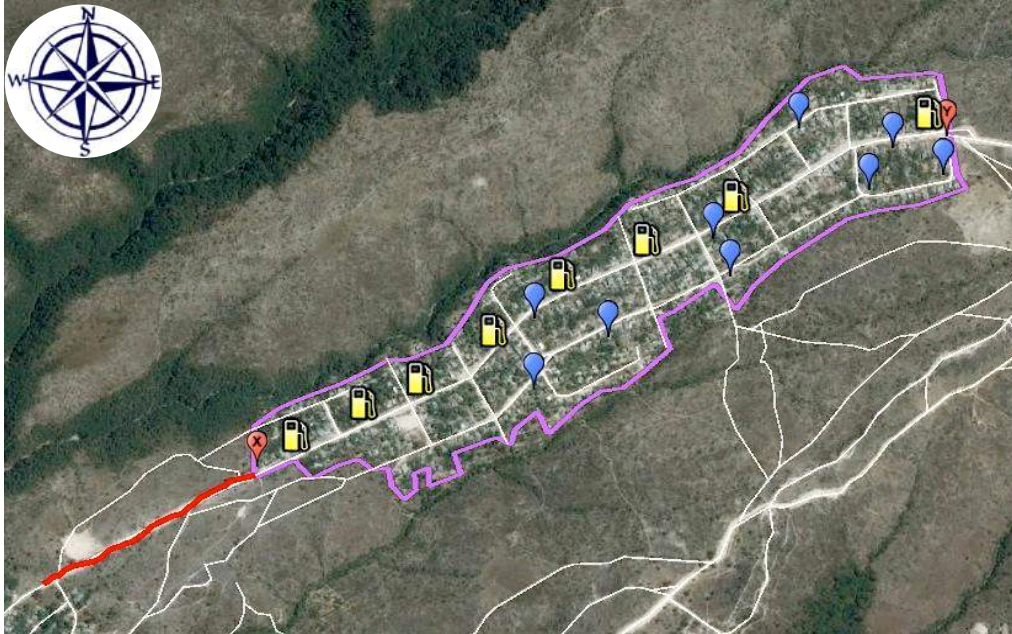


Image 6: Martina Bustos water taps (formal: yellow / informal: blue)

Due to the topography, the informal water taps, which are connected “illegally,” also hinder and obstruct the flow of water from the formal system. Many MB residents tend to accumulate or “hoard” water, which also influences the availability of water flow throughout the rest of the day, often leading to water shortages. MB residents who have the chance to connect their hose usually leave it connected, so when water comes in, they can store it (see Image 9). Water is mainly available at night, which means residents must wake up early to fill up their containers. MB residents report that they have tried to reach the water service institutions to report breakdowns or troubles with the formal water tap system, but to no avail.



Image 7: Water containers are easily accessible and are vulnerable to contamination and vandalism.



Image 8: The water source for the community dining hall is unsecured and easily accessible, making it vulnerable to vandalism and sabotage.



Image 9: Water distribution system consisting of hoses and hose bibs.

There are no sewage structures in the community, nor is there any trash collection service. Black water containing human wastes is not treated, creating a significant sanitary hazard.

Due to the lack of a trash collection service, the community has adopted two methods of waste disposal: burning and burying. Wind carries the toxic fumes from burning plastics and other waste towards community homes and even into the community dining hall where children congregate and eat. Burying trash also presents a problem, specifically at the northern and southern limits of the community, where homes sit alongside ditches that are routinely used for garbage disposal. In these areas, waste is sometimes simply thrown out in piles without burial.



Image 10 and 11: Burning garbage in the community

There are no paved roads in the community and the only public bus passes only once per hour. The ride to Liberia lasts 20 to 30 minutes. On Sundays, the bus's frequency decreases significantly.



Image 12: Martina Bustos bus stop, with no protection from sun and dust



Image 13: Bus stop made completely from recycled materials indicates the community's potential for "sustainable" thinking, recycling, and reuse.

Electricity has been available in MB for around 15 years; any household can simply request the service and pay their monthly bill. Unlike the water service, the electricity company does not require a property title to provide services due to a difference in their internal code. Street lighting infrastructure is already present in MB, which is an indication that the streets have been deemed "public" by the authorities. Despite the availability of electricity, both streetlights and home lighting has very poor electrical infrastructure, due to makeshift installations and lack of resources for repairs.



Image 14: Open meter box and exposed wires.



Image 15: A child in MB plays near exposed livewires and an open meter box. Many meter boxes in MB are within reach of pedestrians.

Information gathered from surveys revealed that some families pay enormously high electricity bills. An electricity expert invited to the August 17th, 2015, GSF/MB community meeting indicated that high electricity bills might stem from bad electricity infrastructure or electricity meters improperly sharing consumption rates between homes.

Flora and Fauna:

In Martina Bustos, the following species of fruit trees were recorded:

Coconut	<i>Cocos nucifera</i>	Arecales: Arecace
Papaya	<i>Carica papaya</i>	Brassicales: Caricaceae
Noni	<i>Morinda citrifolia</i>	Gentianales: Rubiaceae
Avocado	<i>Persea americana</i>	Lurales: Lauraceae
Guanbana	<i>Annona muricata</i>	Magnoliales: Annonaceae
Zapote	<i>Mammea americana</i>	Malpighiales: clusiaceae
Nance	<i>Byrsonima crassifolia</i>	Malpighiales: malpighiaceae
Guava	<i>Psidium guajava</i> L.	Myrtales: Myrtaceae
Tropical almonds (almendro de playa)	<i>Terminalia Catappa</i>	Myrtales: Combretaceae
Mango	<i>Mangifera indica</i>	Sapindales: Anacardiaceae
Lemon/Oranges	Citrus spp.	Sapindales: Rutaceae
Jocote	<i>Spondias purpurea</i>	Sapindales: Anacardiaceae
Cashew	<i>Anacardium occidentale</i>	Sapindales: Anacardiaceae
Sweet passionfruit (granadilla)	<i>Passiflora ligularis</i>	Violales: Passifloraceae

Table 3: Fruit trees currently present in Martina Bustos

Furthermore, most homes have native and non-native potential timber trees. Some of those reported are:

Gliricidia (madero)	<i>Gliricidia sepium</i>	Fabales: Fabaceae
Evergreen oak (encino)	<i>Quercus ilex</i>	Fagales: Fagaceae
Poró	<i>Erythrina</i> sp	Fabales: Fabaceae
Royal Poinciana (malinche)	<i>Delonix regia</i>	Fabales: Fabaceae
Beechwood (melina)	<i>Gmelina arborea</i>	Lamiales: Lamiaceae
Oak (roble)	<i>Quercus</i> sp.	Fagales: Fagaceae
Guanacaste	<i>Enterolobium cyclocarpum</i>	Fabales: Fabaceae

Table 4: Non-fruit trees currently present in Martina Bustos

Flowerpots and home gardens can be found in many households. Though these cannot be considered developed gardens, the occurrence shows an interest in cultivation of some kind. In the future, flowerpots could be used as a source of seeds. These alternative methods are important, as the soil composition of MB renders standard agricultural practices impractical.



Images 16 and 17: Examples of home gardens, which have been observed in different parts of the community

MB residents reportedly planted plantains, bananas, cassava, tiquisque, rice and sugarcane in their gardens. Sweet potato (*Ipomoea batatas*) and pipian (*Cucurbita argyrosperma*) were also reported, but only during the rainy season.

It is notable that five lead members of the MB Development Association practice hydroponic agriculture as taught to them by EARTH University. This means that the MB Community had the potential to grow diverse native and non-native trees using non-standard agricultural practices. Some of the people already use the trees and plants in their gardening and as a supplement to their diet.

Community Life and Communal Space

Besides the church, which sometimes holds activities in its covered space, the only communal area in MB is a small cabin that is used as a community center, meeting place and as the children's dining hall. Outside of the cabin, on barren rock, is the children's makeshift playground. This dining hall was set up in the communal plaza in November 2014. Before the children's dining hall was created, the Development Association, along with other interested members of the community, planned for a day care center, but it has not yet been created, mostly due to economic difficulties.

At noon every weekday, the dining hall serves lunch to around 44 children, who have often been there since 9:00am playing and participating in workshops offered by independent volunteers. These workshops cover different topics, such as English language skills or

sanitation (hand-washing or tooth-brushing for example). It is also common for some mothers to help out and eat at the dining hall as well. The cooks are not paid, and are volunteers from the community.



Images 18 and 19: The dining hall, currently set up in the communal area

Funds for food come from activities run by the MB Development Association, such as bingo nights. Additionally, NGOs like Tej Kohli or The Unbound Foundation sometimes contribute financial support. Protein, like chicken, meat, or eggs, is bought at local stores. Other provisions (juice, rice, beans and sugar, for example) come from a grocery store in Liberia called Los Cartagos.

MB children are weighed in order to determine patterns of malnutrition; the routinely underweight qualify for lunch at the dining hall. Not all MB residents and participants are aware of this process and some claim that children are only selected based on the preferences and connections of Development Association members.

Legal Status and Property Rights

As indicated above, the late Martina Bustos was the private owner of the estate of limestone soil which is now called the Martina Bustos community, and has been inherited by Jose Joaquín Muñoz Bustos. All members of the Martina Bustos community lack property rights to the land on which they live, and community development initiatives and concerns are not incorporated into the larger government of Guanacaste. Members of the Martina Bustos community do not have secure land tenure. However, unlike other informal

settlements without titles, the Martina Bustos plot, being privately owned, is included on the map of Guanacaste and in national cadastral records.

To be awarded a land title in Costa Rica, occupants of informal settlements must meet certain minimum requirements, including having established occupancy for five years as well as having Costa Rican citizenship. In principle, those who meet the minimum requirements cannot be evicted from their homes. According to the data collected and displayed in the figure below, 325 of the 466 respondents have lived in Martina Bustos for more than five years.

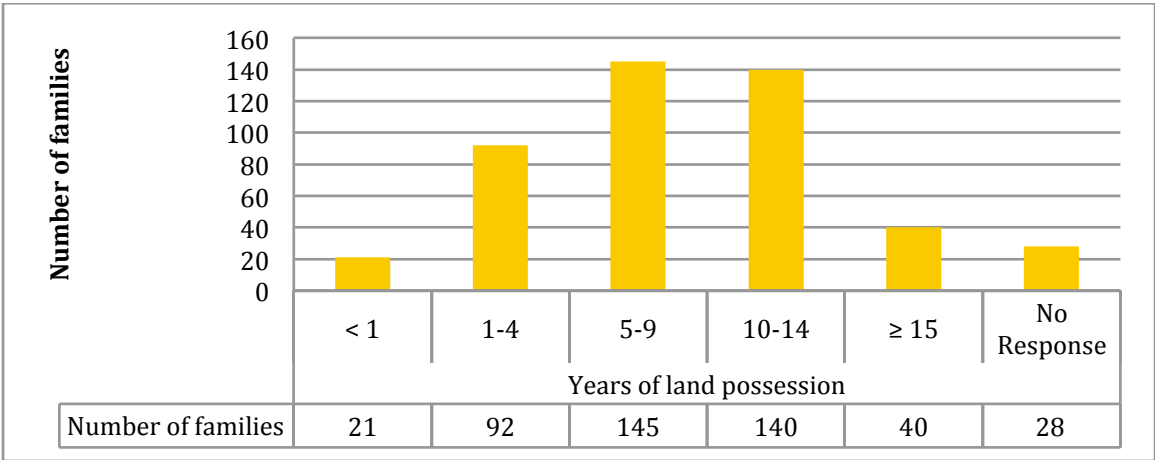


Figure 1: Families in MB sorted by years of land possession

In 2013, with the assistance of a Costa Rican migration entity and the Nicaraguan Consulate, members of the Martina Bustos community received information on legally establishing in Costa Rica. A considerable number of community members were able to get their documents in order, but some still remain undocumented and are considered illegal immigrants, as illustrated in the figure below. In dialogues with the community, the interviewer found that members of the Martina Bustos community are marginalized by their undocumented or ill-documented status.

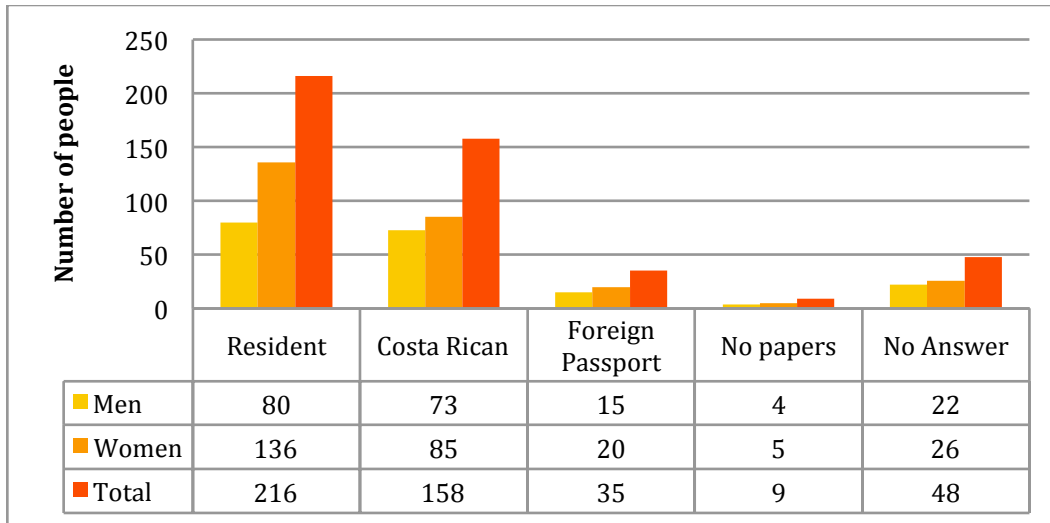


Figure 2: Population in MB according to legal status

Income and Economic Opportunity

Guanacaste is considered the epicenter of tourism and real estate development in Costa Rica (Ross, 2010). In Liberia, government officials see the Liberia Airport as one of the driving forces of Guanacaste’s tourism and real estate development, helping to position Liberia as a city center, providing legal, medical and other services to the burgeoning industry (Morales and Pratt, 2012). Despite the economic development in the region, data on family income in MB, illustrated in the figure below, reveals that an alarming 43% (202 families) of families in Martina Bustos reported having no income at all. 53% (247 families) reported earning under \$568 per month, and 3.7% (17 families) reported earning more than \$568 per month.

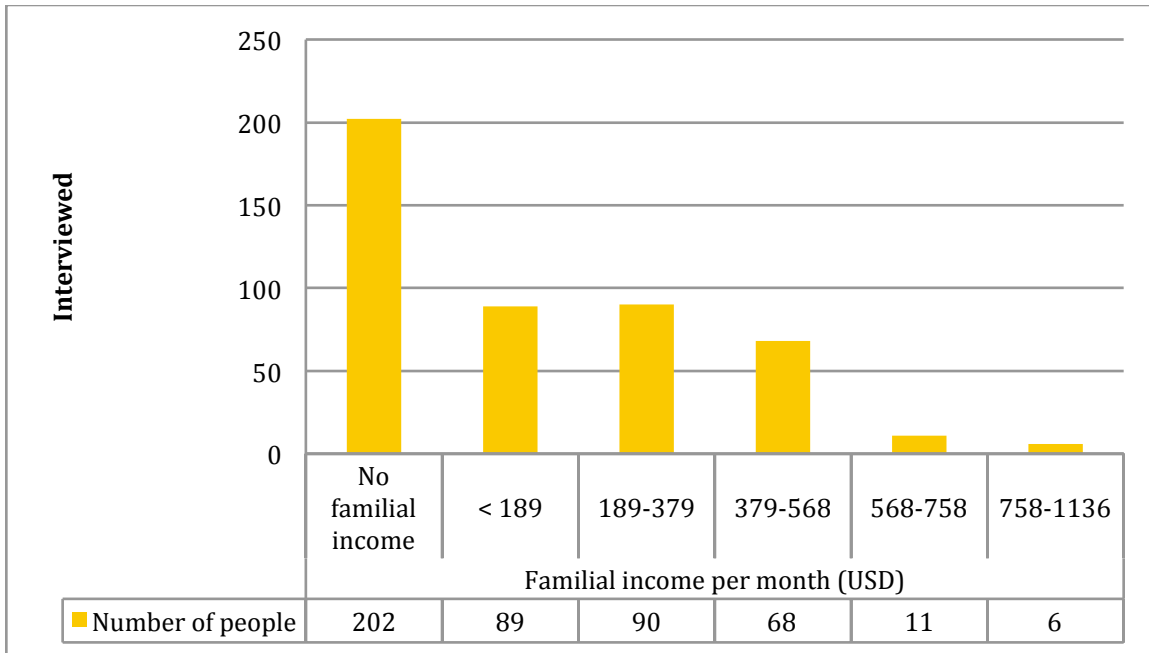


Figure 3: Income of families interviewed

Of the 466 people interviewed, 70 respondents reported they work in their own homes, 68 work in independent businesses (e.g. grocery stores, street sales, construction work), 81 reported having occasional work opportunities or working odd jobs, 95 are unemployed, 63 have permanent, salaried employments, 9 are pensioned, 1 person is a priest, 10 people reported working in the homes of others (e.g. domestic helpers, gardeners, etc.), 41 respondents work in recycling, 1 is working as an artisan, and 27 respondents did not answer. In addition to the glaring unemployment rates in MB, it is clear from this survey that a significant number of members of the MB Community are now engaged in occasional, informal, and non-permanent employment.

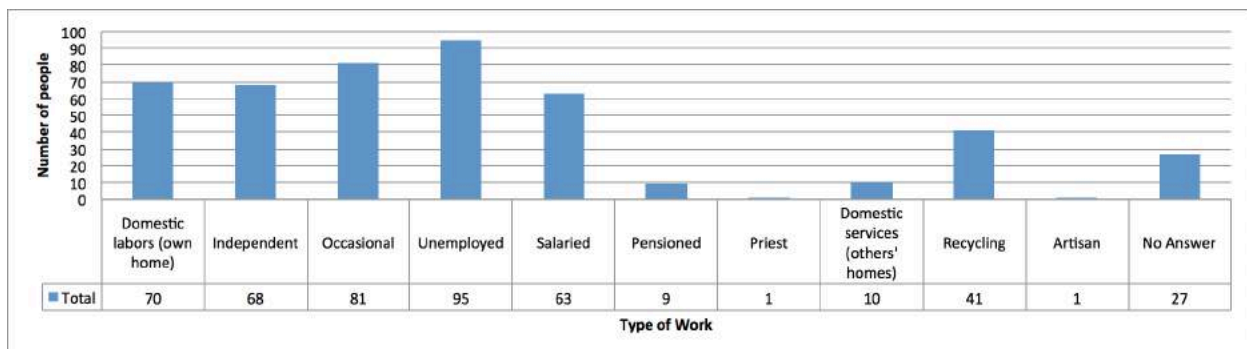


Figure 4: Types of work among interviewees

Education and Literacy

The figure below illustrates that most of the underage members of the MB community are currently attending school.

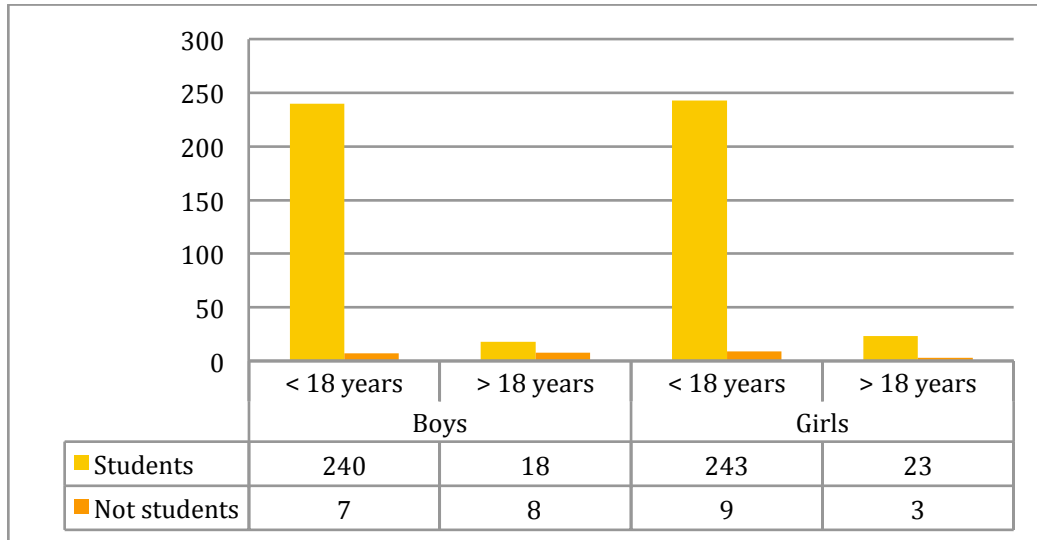


Figure 5: Students vs. non-students among young people in MB

It should be noted, however, that although most children are attending school, the quality of the education is low, and a large number of students appear to be lacking basic numeracy and literacy skills. In Figure 5, above, it is also notable that 11 adults (8 men and 3 women) are still studying, despite being over the age of 18. Community members report limited access to secondary education, which is generally of low-quality.



Image 20 and 21: The Nazareth school has broken windows with sharp glass within student's reach.

Crime



Image 22: Road where criminal activity has been reported

MB community members report crimes such as prostitution and drug consumption. Police control and crime management in the area is passive, not active.

Key Players: Community Stakeholders and Aid Organizations

A recently established Community Development Association offers community members access to several resources (such as support from local NGOs) as well as a collective voice towards working towards land and housing rights. The association, however, has no formal record of all the households in the MB Community, and does not have an accurate view of the land distribution in MB. The association has an internal structure, consisting of officers and members from the MB community, but their roles and plans for the community are not clearly defined.

Different organizations, such as community-based organizations and NGOs, organizations from the private sector together with international donors and institutions (full list in Appendix) have provided and continue to support the community in a variety of different ways. Because of a lack of communication and proper coordination with the community, there are many overlapping projects and programs, as well as unequal and ineffective distribution of support.

3.2 Critical Issues



Image 23: Members of the Martina Bustos Community identifying “Critical Issues”

Many persistent issues hamper the potential of the Martina Bustos community to develop. Data collected during this study, followed by in-depth discussions with members of the community, have identified the following as the most critical issues:

Land Property Rights and Legal Status

One of the most vexing problems in MB is the lack of clear land ownership, and the fact that no one among the members of the MB community has a property title. There is ambiguity around current land property rights, as well as around pathways to legal citizenship status, which many in the community still lack. These problems are exacerbated by the existence of numerous stakeholders—the landowner, the authorities, the community itself—with sometimes conflicting interests.

Economic Opportunities

A significant number of members of the MB community are now engaged in informal economic activities and unstable work. Limited access to education, lack of skills, and unclear residency statuses aggravate this condition.

Human Capital

The community identifies poor human capital as one of the critical issues which, once addressed, could benefit the community considerably. Low human capital is linked to the current levels of: skills and professional capacities; education quality; women empowerment; sexual education and family planning; and community organization. All of these affect the ability of individual residents and the community as a whole to participate in productive economic activities.

Infrastructure

The lack of proper infrastructure is a major challenge for the MB community, which is characterized by: limited access to clean, quality water; limited access to a reliable supply of electricity; makeshift homes built with no safety regulations; uneven and unpaved roads, with impacts on health and transportation; poor sanitary conditions; no reliable garbage collection; no proper toilets and sewage treatment; poor drainage; inadequate domestic and street lighting; lack of adequate community facilities; and very poor personal security.

Health

Life in a degraded environment, in combination with unreliable access to health services, inadequate nutrition, alcoholism, drug addiction, and a lack of opportunities for organized physical activity, all underlie poor health conditions in the community.

Community Identity

A weak sense of community is one of the most pressing issues in Martina Bustos. Lack of trust is high among members of the community. The will to socialize is low, and there are few opportunities to do so. Community identity is lacking mainly due to constant migration and transience among residents. Negligence by the authorities is rampant. Furthermore, discrimination, alienation, and low self-esteem produce a drag on development.

The recent establishment of the Community Development Association has been an important step towards ameliorating some of these conditions.

Summary

The critical issues that affect the MB community are interdependent. They interact in many ways, which often reinforce and amplify adverse conditions, leaving the community in a self-perpetuating trap. For example, ambiguity in status, affects access to education and skill-acquisition opportunities, thus limiting job opportunities, productive participation in

the formal economy and ultimately income, which in turn perpetuate poverty and marginalization. The cycle, thus, repeats itself.

At the same time, understanding the underlying interactions help us identify significant leverage points, which can be used as the cornerstone for crafting an effective transition (development) strategy.

In the next section, we will explore these interdependencies and the leverage points that result.

4 Whole System Perspective

4.1 Introduction to Causal Loop Diagrams

Causal Loop Diagrams can be used to show the way in which a set of variables—in this case, the critical issues identified by the MB community—are interlinked. This type of diagram pays particular attention to the way in which problems can be self-reinforcing. It also provides an opportunity to identify leverage points within the system, which will serve to inform the strategy for Project Transition.

How to read Causal Loop Diagrams

In Causal Loop Diagrams, arrows represent relationships between variables (as seen in Figure 6 below). Each arrow is marked with a polarity sign (+ or -). The polarity is assigned by looking at each relationship individually, and asking what would happen to the dependent variable if the independent variable increases, all else equal. A plus sign states that an increase in the independent variable will also lead to an increase in the dependent variable, whereas a minus sign would indicate that an increase in the independent variable causes a decrease in the dependent variable. In other words, a plus sign indicates that the dependent variable moves in the same direction as the independent variable, whereas a minus sign indicates that the dependent variable moves in the opposite direction of the independent variable. In some cases, the +/- polarity can also signify an improvement/dis-improvement in the dependent variable, instead of an increase/decrease.

In **Figure 6**, the arrow marked with a plus sign says that an improvement in the *State of the community's environment* (the independent variable in this case) will lead to more *Appreciation of their surroundings* (the dependent variable in this case), all else equal. It also says that a deterioration of the community's environment will lead to less appreciation of their surroundings.

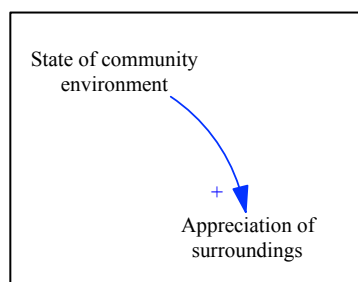


Figure 6: Positive causal relationship

Figure 7 shows an example of a feedback loop. In this loop we see how more *Appreciation of surroundings* will lead to less *Polluting the environment* (for example, people will be less likely to litter or dump trash carelessly). Less pollution will then lead to a better *State of the community environment*, which will again lead to more *Appreciation of surroundings*, less *Pollution*, and thus an even better *State of the environment*. As such, we can see that there is a feedback effect. As described, this loop can work as a “virtuous” feedback loop, in which a better state of the environment will eventually lead back to a better state of the environment—a desirable outcome. However the loop can also work in the opposite direction, in which a deteriorating environment leads to less appreciation of the environment, which leads to more polluting, and thus an even more deteriorated environment. In this instance, it would constitute a “vicious” loop. Currently, Martina Bustos seems to be experiencing the latter.

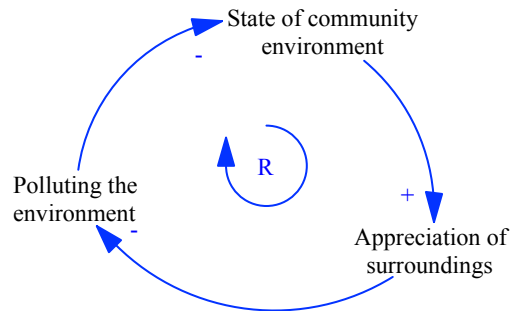


Figure 7: An example of a reinforcing feedback loop.

4.2 Current Situation

In the diagrams that follow, we elaborate on the current situation in Martina Bustos, as we have perceived it according to survey data and in-depth discussions with the community. The following section provides a systemic analysis of the situation, showing how the reinforcing loops in action in Martina Bustos are currently working as vicious cycles, keeping the residents of the community trapped in their current state. We will first explain these loops one by one, and then explain how they interact to form the whole.



Figure 8: Feedback loops: R1 "Land Titles" and R2 "Political influence"

Loop R1: Land Titles

Fraction of people with titles to their land → Feeling of Belonging → Sense of community → Effectiveness of community organization → Trust in community by owner and authorities → Willingness of the owner to donate the land → Fraction of (...)

Currently, no MB resident has a title to their land. It has been reported that this is a major reason for the lack of a sense of belonging among the residents. This lack of belonging reduces the sense of community, which in turn leads to less community cohesion and thus less effective community leadership/organization. This in turn reduces the landowner's trust in the community, leading to a lack of willingness to donate the land to the residents. This results in an even lower sense of community.

A double dash on the arrow, as illustrated in the link from *Willingness of owner to donate the land* to *Fraction of people with titles to their land* implies a significant time delay between changes in the independent and the dependent variable.

Loop R2: Political Influence - Community Organization

Effectiveness of community organization → Political Leverage → Successful community projects → Sense of community → Effectiveness of (...)

The lack of effective community organization also makes it harder for the community to gain any political leverage. This makes it more difficult for them to successfully implement meaningful projects that improve the community. This in turn creates frustration among

the community members, which reduces the community cohesion and makes the community organization even less effective.

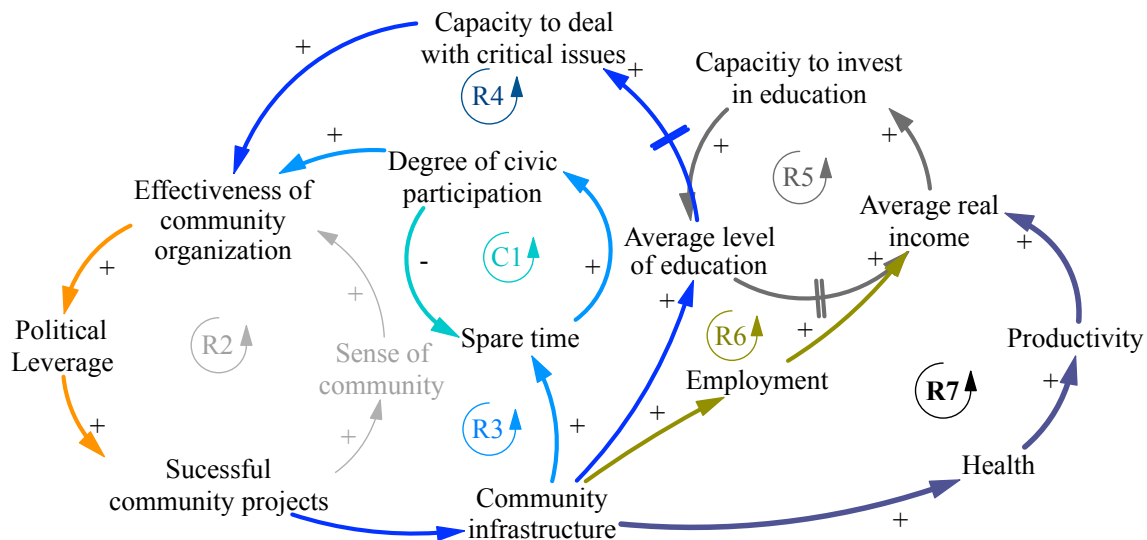


Figure 9: Feedback loops: R3 "Infrastructure and Spare time," R4 "Infrastructure, Education, and Capacity to deal with critical issues," R5 "Income and Education," R6 "Employment and Education," R7 "Health and Economic situation," and Loop C1 "Shortage of free time"

Loop R3: Infrastructure – Spare Time

Community infrastructure → Spare time → Degree of civic participation → Effectiveness of community organization → Political leverage → Successful community projects → Comm. infrastructure (...)

As a result of poor infrastructure, people currently allocate a lot of time to everyday activities such as fetching water or bringing their children to far-away schools. This means that they have less time available for economic or civic participation. Low civic participation leads to less effective community organization, which in turn makes it more difficult to implement meaningful projects. This makes it even less likely that they enhance the state of their infrastructure. Note that *Community infrastructure* refers to physical as well as social infrastructure.

Loop C1: Scarcity of Spare Time

Spare time → Degree of civic participation → Spare (...)

Unlike the loops described above, this loop is not reinforcing but instead counteracting (hence the name C1), which means that an increase in one variable in the loop will

eventually lead to a decrease in that variable. In this case the loop demonstrates that time is a finite resource and that the more time spent in civic activities, the less spare time there will be for other activities.

Loop R4: Infrastructure – Education – Organizational Capacity

Community infrastructure → Average level of education → Capacity to deal with critical issues → Effectiveness of community organization → Political leverage → Successful community projects → Comm. infrastructure (...)

The reportedly low quality of education (low quality school for children and no training centers of any kind for adults) that residents receive reduces the capacity of the community to deal with critical issues in the long run. This results in MB community members having fewer skills to contribute towards effective community organization, successful community projects, and thus quality infrastructure.

Loop R5: Income – Education

Average real income → Capacity to invest in education → Average level of education → Average real (...)

Real income levels are low in MB. As a consequence, there are no financial means to send children to better schools or for parents to get training for job opportunities. In addition, parents might not have the time or ability to help their children with homework, as low incomes force them to work more hours. This phenomenon leads to lower average levels of education, which in the long term will prevent residents from taking up higher-paying jobs, thus reiterating the loop.

Loop R6: Employment – Education

Community infrastructure → Employment → Average real income → Capacity to invest in education → Average level of education → Capacity to deal with critical issues → Effectiveness of community organization → Political leverage → Successful community projects → Community infrastructure → Employment → Comm. infrastructure (...)

As described for loop R3, poor infrastructure means that (a) people must currently expend a lot of time completing basic tasks such as fetching water and (b) access to nearby towns is hindered by poor roads and public transport. This implies that residents have fewer opportunities to engage in economic activities, which reduces income and thus the ability of the community to invest in education. This lack of education then hinders progress in

Loop R8a: Growth of Vegetation

Vegetation → Soil Regeneration → Soil Fertility → Vegetation (...)

The poor quality of the soil in MB makes it difficult for vegetation to grow there. The resulting lack of vegetation prevents the soil from regenerating because there is (i) less ability for it to retain water in the soil and air, (ii) fewer roots to retain the soil itself, and (iii) less biomass material to protect the soil from UV light, as well as to enrich the soil with nutrients through decomposition (what is known as ‘mulching’).

Loop R8b: Growth of Biomass

Vegetation → Biodiversity → Soil Fertility → Vegetation (...)

Lack of vegetation in the community does not only result in the effects described above, it also reduces the potential for biodiversity. Lack of biodiversity in turn reduces the fertility of the soil: For example, lack of plant diversity means that the soil will lack a balanced input of nutrients from these plants.

Loop R9: Environment

Polluting the environment → State of environment → Appreciation of surroundings → Polluting (...)

As explained in the beginning of this section, polluting the local environment of MB (e.g. throwing trash carelessly) leads to a deterioration of the environment, which then causes residents to appreciate the environment less. The less the environment is appreciated, the more likely it is that it will be polluted.

Loop R10: Security

Quality of life → Crime rate → Security → Quality (...)

A low quality of life leads to higher crime rates, which lowers security in the community. This in turn leads to a further decrease in the quality of life, which could increase crime rates further.

Loop C2: Quality of Life

Quality of life → Relative attractiveness of MB → Net immigration to MB → Total population of MB → Available Housing → Housing costs → Average real income → Quality of life (...)

The *Quality of Life* offered by Martina Bustos, though precarious under present conditions, increases the *Relative attractiveness of MB*, as conditions in residents' places of origin tend to be even harder. Therefore, the *Net immigration to Martina Bustos* increases, as does its *Total population*. The birth rate is a factor that also increases the total population. When population increases the *Available housing* decreases due to the occupancy rate of free plots and former occupied houses. If there is *Available housing*, immigrants do not have to pay rent or expend building costs, thus the *Housing costs* decrease. *Housing costs* decrease the *Average real income* of residents, as money spent on housing cannot be used or invested to satisfy other needs, which would lead to an increase in the quality of life. This feedback loop, working under current conditions, indicates that *Quality of Life* in Martina Bustos does not present a growing structure but a stabilization structure. In other words, MB inhabitants will not be able to increase their *Quality of life* using their labor income, given the growing housing costs due to the limited available housing in the face of growing demand, stemming from high immigration rates to the community.

4.3 Whole System

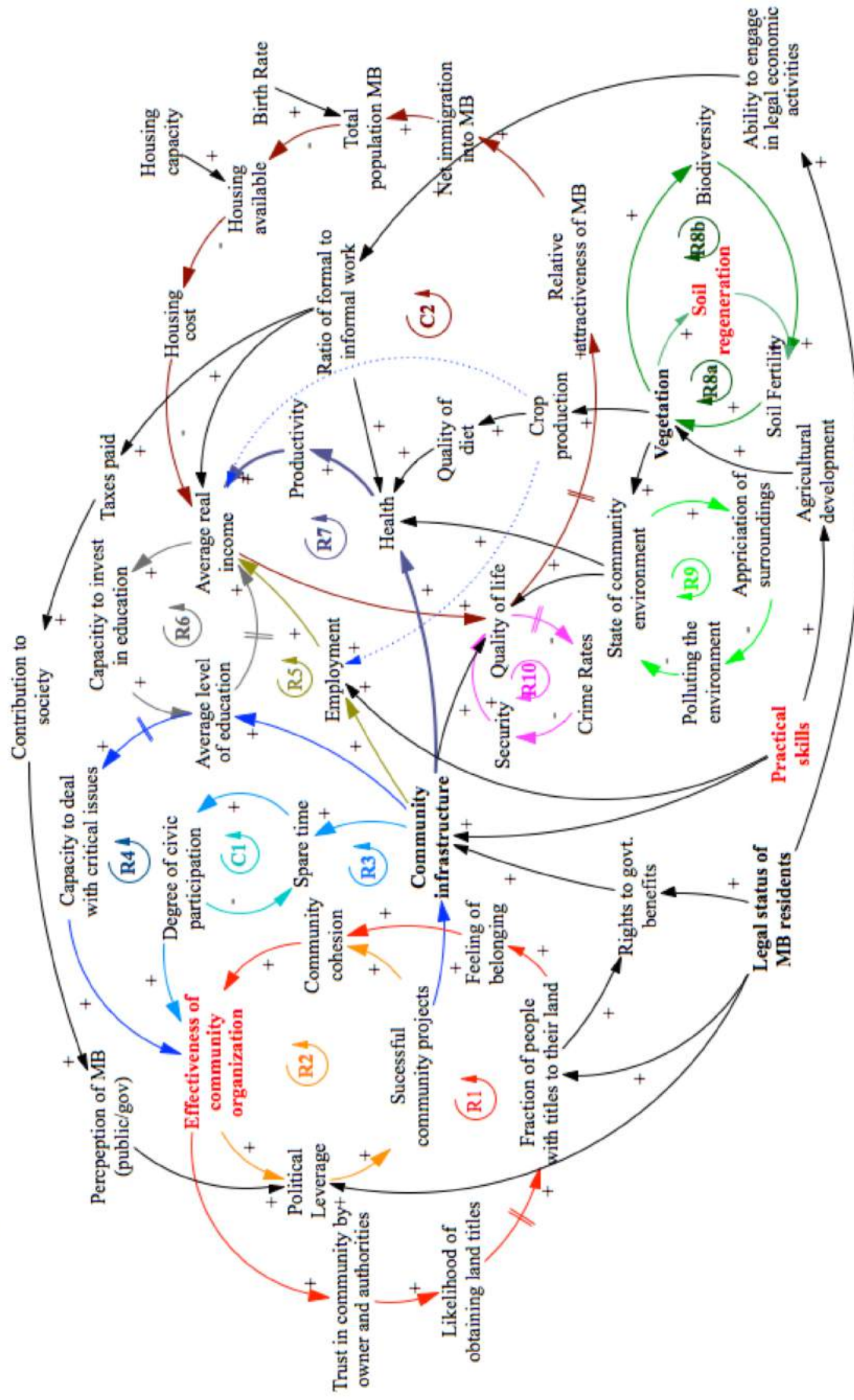


Figure 11: "The Whole Picture." Feedback loops: R1 "Land titles," R2 "Political influence," R3 "Infrastructure and Free time," R4 "Infrastructure, Education, and Capacity to deal with critical issues," R5 "Income and Education," R6 "Employment and Education," R7 "Health and Economic situation," Loop C1 "Shortage of free time," R8a "Increase in vegetation," R8b "Increase in biomass," R9 "Environment," R10 "Security," and CR "Quality and cost of life"

Having discussed each of the vicious cycles that characterize the current situation in MB, the above diagram shows how these feedback loops interact. The implication of the interaction is that if one loop acts as a vicious cycle, then it can adversely affect other loops. For example, if poor *Community infrastructure* is causing the R3 loop to be a vicious loop, then this will also drag the *Community organization* (R2) loop into a vicious cycle, due to its effect on civic participation. Additionally, we see that poor *Community infrastructure* will also decrease the *Quality of life*, which will drag the R10 loop into a vicious cycle.

Furthermore, we see how the vicious loops of R8 and R9 reduce the health of the people in Martina Bustos, which in turn eventually affects the *Average real income*. This affects many other loops in turn, as illustrated in the diagram.

In addition, there are a number of important variables that are not a part of any loops. Most notably, the degree to which various *Practical skills* are present in the community influences the extent to which people can build infrastructure themselves, their employability, and their ability to grow crops. Additionally, the legal status of the residents is seen to affect the fraction of people with titles to their land, as well as the community's right to government benefits, which in turn should improve/increase the community's infrastructure. Residents' legal status also affects their ability to engage in legal economic activities, which will eventually increase the amount of taxes paid and thus their contribution to society. This could increase the community's political leverage by improving the government's/public's perception of the community.

Looking at this diagram, we can see how the residents of Martina Bustos are trapped in several vicious cycles that keep them in their current situation. However, understanding the nature of these loops also holds the key to alleviating the problems. If we manage to steer the reinforcing loops into a direction where they become virtuous loops, we can initiate dynamics that lead to a development boost in the community.

4.4 Global Context: The True Cost of Poverty

The same mechanisms that have created the self-perpetuating cycles in the community of Martina Bustos work in similar ways in other communities around the world. In this state, outside intervention is required to alleviate poverty and create community development. There are many reasons for investing in poverty reduction. From an economic point of view, poverty is related to large social costs, both for the individual citizen and for society at large. Children growing up in poverty are more likely to complete fewer years of

schooling. Other long-term effects of growing up in poverty include unemployment and underemployment, poorer health, and a higher likelihood of engaging in crime later in life (Baker & Coley, 2013). These forces have the potential to create a reinforcing feedback loop where poverty is transmitted intergenerationally. In the United States, the costs of child poverty are estimated at approximately \$500 billion per year, corresponding to four percent of the GDP (Baker & Coley, 2013). In the UK, the yearly cost of child poverty is estimated at £25 billion, which is equivalent to two percent of GDP (Laurie, 2008).

In addition, there are remedial costs related to poverty, which include health care expenditures and crime-induced costs. Health-related costs do not only include health expenditures, but also productivity loss due to poor health. Crime-induced costs include the monetary and personal costs for the victims, as well as the societal cost of maintaining and administrating the criminal justice system. In Canada, as a consequence of poverty, an annual 7.6 billion US dollars are added to the health care budget. In addition, if crime committed as a consequence of poverty were eliminated, an annual \$1-2 billion would be saved (Laurie, 2008).

Furthermore, there is an opportunity cost to poverty, caused by a loss in productivity, which thus reduces the goods and services provided to the economy. This in turn leads to lower tax incomes for the government. In Canada, the annual loss in income tax revenue as a consequence of poverty is estimated to fall within the range of \$8.6 and \$13 billion (Laurie, 2008).

Figure 12 gives a feedback perspective on the cost of poverty, with intergenerational, remedial and opportunity costs adding to the total cost. The dotted line indicates that, logically, the higher the cost of poverty for the society, the more governmental interventions targeting poverty should be carried out. If C1, the *Governmental policy* counteracting loop, is not at play, the societal cost of poverty will continue to increase. Meanwhile R1, the *Poverty trap* loop, works as a vicious cycle. It keeps the poor in a state of poverty and transmits poverty intergenerationally.

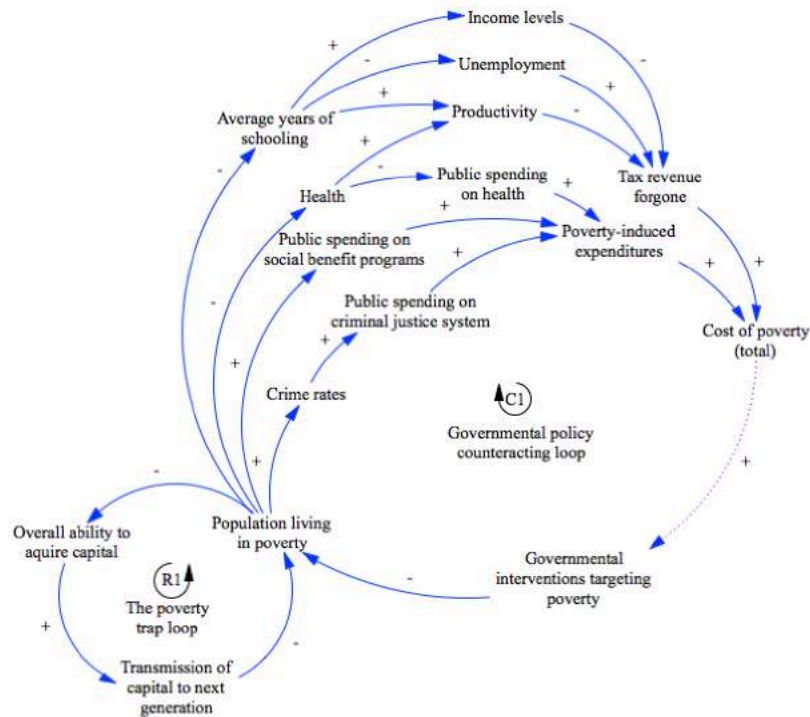


Figure 12: "The social cost of poverty." Feedback loops: "Governmental policy" and R1 "The poverty trap"

4.5 Leverage Points

Having gained an understanding of the dynamics of the current situation as condensed in Figure 11, we detected five main leverage points where effective intervention can help tackle the critical issues identified. Leverage points are variables that have a strong impact on the overall state of community life, which can be changed significantly with a reasonable amount of time and effort.

We will now discuss the leverage points identified in the community. The first three can largely be influenced from within the community, while changes in the latter two are more dependent on interventions from outside.

1. Effectiveness of community organization

This is a central variable of the diagram, since it is directly part of four loops and influences many others indirectly. Organizing and leading the community more effectively and cohesively is the precondition to turn loops R1-R4 from vicious to virtuous.

Better community organization will increase trust from the authorities and the landowner, making it more likely that they drop their objections to transferring land titles to the

community. Receiving land titles would greatly strengthen the community identity and make them feel more rooted in MB, which according to community residents, would make them more willing to invest and participate in community development and organization. A stronger organization will also give them more political leverage when dealing with authorities, and over time, will allow them to implement more important community projects, such as improving the social and physical infrastructure. Enhancement of infrastructure will make their daily routines more efficient and therefore allow them to spend more time in civic participation or other activities, while also allowing them to invest more in education, building their capacity to deal with critical issues—all of which ultimately increases the strength and effectiveness of community organization.

Hence, initially investing in strengthening community organization and leadership will ultimately lead to a positive self-reinforcing process that empowers the community and its members. This process also leads to improvements in many other variables, such as infrastructure, that then positively affect other aspects of the community's daily life.

2. Practical skills

As a matter of developing human capital, improving and increasing the variety of practical skills in the community can be extremely helpful in alleviating their overall situation. Community members can use practical skills for maintaining and/or constructing physical infrastructure, which would also increase their sense of empowerment and belonging. Practical skills in the realm of agricultural development, could also be used for crop production, gardening and planting, which would in turn increase the soil fertility and biodiversity. Moreover, greater variety and proficiency in any set of practical skills will make the community members more employable, opening up new economic opportunities.

3. Soil regeneration

Growing more vegetation in the community, when executed with a maintained effort, triggers a self-reinforcing process, as plants start retaining soil with their roots, delivering carbon, fixing nitrogen and providing shade and moisture that prevents the soil from drying out. This leads to higher soil fertility, which in turn increases plant growth and vegetation, as well as biodiversity. Examples show that growing pioneer species will soon attract follower animals and plants. Introducing more trees and other plants in the community will create a cooler and more favorable microclimate in MB (less dust, more shade etc.) that benefits the health of the residents. And with better health, they will be more productive in their other endeavors, leading to many other positive effects.

Furthermore, transportation infrastructure will be stabilized and less exposed to degradation with protective vegetation. A greener Martina Bustos could also well increase the attractiveness of the place and make residents feel more connected to their home, strengthening community spirit. However, the biggest benefit will be the economic gain through home farming: since many people are reportedly unemployed, they can use their spare time for crop cultivation and thereby produce a good part of the food they currently have to purchase. This will not only free up income that can now be spent on other needs, but will also introduce a variety of healthy food into their diet, which again improves health.

4. Community infrastructure

The poor community infrastructure is directly linked to a number of the critical issues contributing to the overall situation in the community, illustrated by the fact that community infrastructure is part of four reinforcing loops. Improving the social infrastructure in terms of health care would increase health levels in the community and increase overall productivity, while investments in better schools and day care institutions would lead to better levels of education and more spare time for parents. Both of these would be prerequisites to increasing the effectiveness of the community organization, which would make it more likely that the community is able to complete further efforts to enhance their infrastructure. Investing in infrastructure would thus create a self-reinforcing dynamic that quickly adds further value to initial investments.

Moreover, improvements in physical infrastructure such as roads, water access and public transport would enable people to carry out their daily routines more effectively (e.g. fetching water, getting to work), so that they would have more time to engage in civic and economic activities, further reinforcing the positive dynamics and eventually also strengthening community identity. The improvements in transportation infrastructure described would also allow residents to reach further-away work destinations, increasing their economic opportunities.

5. Legal status of MB residents

The legal status of the community members is a critical issue in the transformation process. Firstly, legal status helps the community members to engage in formal employment. This allows them to contribute to the economy at large, for example through tax payments. In addition, informal jobs such as working on the landfill often expose workers to health and security risks. Hence, as the population moves from informal to formal employment, the health of the residents of Martina Bustos will improve, which will then lower the need for

public spending on health services in the region. Another effect of granting legal status is increasing the possibility for the community members to receive land titles. A larger fraction of the population with titles to their land may help strengthen community identity by creating a sense of belonging. As this process unfolds, it will bring about improvements and systemic change in all parts of the system.

5 Strategic Approach

In accordance with The Lab's Five Core Sustainability Principles, and based on the systemic analysis and in-depth discussion with community members, we have drawn a number of conclusions. These conclusions form the overall strategy for Project Transition.

- Development processes are inherently complex. Therefore a systemic and holistic approach to development is required. Strategic interventions that are part of Project Transition must keep in mind the interrelatedness of all the different issues within the community.
- Our systemic analysis demonstrates that there are a number of leverage points that could guide interventions for maximal effectiveness.
- Project Transition should involve actions of different scope. Some of these can be undertaken by community members themselves, requiring relatively small amounts of resources, yet having the potential to create empowerment and improve livelihoods in the short term. Other activities, of larger scope, require support and investments from outside.
- Project Transition should therefore require an effective coalition, including the community, the local and national government, the donor community, civil society organizations, and other important stakeholders.
- Project Transition offers an opportunity to develop a model regional hub aimed at building capacities and finding enlightened approaches to dealing with persistent issues related to migration, refugee populations and poverty, all of which come at enormous social cost. The related policy considerations are relevant to this region, as well as to other parts of the world where migration issues are becoming increasingly challenging.
- Specifically, a comprehensive strategy for Project Transition, calls for:
 1. Settling legal status and land title issues;
 2. Investments in community empowerment, strengthening of community identity, and community organization;
 3. Investments in the development of human capital;
 4. Investment in the creation of economic opportunities;
 5. Investments in physical infrastructure and the environment.

6 Recommendations

Taking into account community needs and perspectives and using the lens of The Sustainability Laboratory's Five Core Principles of Sustainability, the following section provides recommendations for the future development of Project Transition. These recommendations include advice on how to set up the project, point to the main areas that require intervention, and offer specific suggestions for projects that can be carried out within these areas.

1. Set up project organization in order to structure and manage Project Transition.

The first phase of developing Project Transition should be devoted to the creation of a robust and viable project organization. More specifically, any actor undertaking Project Transition must:

- Commit to, and officially launch, Project Transition
- Identify project leadership
- Establish a project team
- Identify key partners and secure their participation
- Secure initial funding
- Clarify roles and responsibilities
- Create and put into place a structure for internal communication

2. Address the issues of land titles and legal status.

Set up a special task force to address the issues of land titles and legal status. This task force can be managed by the Community Development Association, but supported by appropriate experts from the outside. Consider integrating the broader community in order to create a vehicle that could obtain titles to the land as a whole.

3. Develop a comprehensive master plan for Project Transition and develop all its major components.

- Create a strategic short, medium, and long-term plan of action. Launch activities which can be implemented easily in the immediate and which can bear fruit in the near future
- Use the development of the master plan and its implementation as a capacity building opportunity for community members

The key issues to be addressed by the plan are as follows:

A. Design a process for empowering and strengthening community identity and organization:

- 1. Create the Martina Bustos Declaration of Principles, based on a commitment to long-term sustainable development, by engaging all members of the community in developing and adopting the declaration.**

- 2. Foster community identity through the expression and celebration of the aforementioned Common Principles through social interactions, cultural activities, and community infrastructure. Recommendations include the following:**
 - Celebrate community identity through cultural events and creative expression
 - Design a project for community unification through music, dancing, painting, handcrafting, etc.
 - Develop community art projects to decorate houses in the community or streets
 - Design and develop communal space, including a public library, learning/playing space for children, a common hall for celebration and community meetings

- 3. Develop community leadership, organization and participation:**
 - Identify a group of people who can guide community projects
 - Design an accountability system for community leaders so that leaders can build community trust
 - Develop crowdsourcing campaigns, social fundraising events, and a community fund for integration and empowerment projects
 - Create community projects and community resource sharing and support groups
 - Create an annual community calendar of events
 - Develop democratic governance structures, community decision-making, and conflict resolution processes
 - Explore interfaith coalition opportunities within the community in order to advance community cohesion
 - Create an archive containing relevant documents, legal and otherwise, of significance to the community and its members

4. Enhance community communications:

- Establish a community website, news board, radio channel, and audio system capable of reaching the entire community
- Set up a communication team to disseminate news and information within the community
- Establish the Development Association's formal communication channels, such as e-mail accounts, Skype-accounts, phone numbers, and an address for the (future) office of the Development Association, so community members can access them directly
- Create a database containing information about organizations of potential interest to the community

5. Develop the educational capacities of community members, so they are able to teach and transfer their knowledge to one other, to organizations, and to communities facing similar challenges:

- Develop teacher training workshops
- Design and implement leadership development workshops

B. Design a process for developing and strengthening the human capital in the community.

1. Create a skills and knowledge inventory, connecting community members with potential employers in Liberia and spurring skills-training development programs within the community:

- Conduct assessment to ascertain which skills and knowledge are present within the community
- Make the results publicly available, allowing interested residents to reach out to those with sources of knowledge

2. Set up regular workshops for skill development:

- Conduct a survey to identify which skills are lacking and/or desired in the community
- Secure the necessary resources for offering workshops, which could include: looking for partner training organizations, such as EARTH University or INA, and/or finding external supporters to provide funds or necessary materials
- Introduce the sessions based on the wishes expressed by the community, and the availability of facilitators

3. **Apply to the Ministry of Education to establish an elementary school within the community, obtaining legal assistance for the process, or research the possibility of integrating MB students into higher-performing area schools.**
4. **Improve personal communication and conflict resolution skills, since these have been identified as major obstacles for the community:**
 - Implement conflict resolution trainings for individuals. Provide individuals with opportunities to develop effective communication skills
 - Teach professional interview, resume, and communication skills to aid community members in finding more gainful employment
5. **Provide training in computer/digital literacy and skills:**
 - Focus on skills that can support professional development
 - Create an inventory of online classes and materials that maybe useful for members of the community

C. Design a process for developing economic opportunities in the community.

Developing current economic activities in the Martina Bustos community will serve as a baseline in evolving and strengthening the economic potential of the community.

1. **Conduct a survey to determine business development and employment opportunities within MB and its immediate surroundings and to strengthen links between MB and the regional economy.**
2. **Connect the needs of local employers to skill training for the members of Martina Bustos, and to the improvement of their infrastructure and environment.**

For example, a construction company could teach labor skills to some residents through the process of working on housing in the community. This would train the residents in a skill which would make them employable to the construction company, while also improving the living conditions of the residents.
3. **Develop workshops for job interview and related skills.**
4. **Organize small business owners in order to help leverage their effectiveness. For example, by:**
 - Creating Martina Bustos products and a Martina Bustos brand

- Having weekend markets and other designated areas for selling locally made products within the community
 - Establishing a Community Entrepreneur Association, including an Association of Women Entrepreneurs
 - Develop strategies to help families by promoting diversification of small-scale economic activities (e.g. recycling, home gardening, small-stock rearing, handcrafts and other small businesses)
5. **Establish a microfinancing facility in order to finance small scale economic operations.**
 6. **Establish a community food processing and preservation enterprise based on local production.**
 7. **Explore opportunities to develop eco-tourism services, given the region's many sites of attraction.**

D. Design a process for improving physical infrastructure and the environment.

1. Undertake the following:

- Develop a comprehensive land use plan
- Determine available resource potential and establish a system for turning waste into resources
- Improve current electricity infrastructure
- Improve access to Internet and other communication technologies
- Incorporate renewable energy production systems and resources
- Investigate the potential to convert albite-shaped silicon currently present in the soil into silicon acid
- Improve roads, bicycle routes, and availability of public transportation
- Improve lighting in public spaces and individual homes
- Test for water quality, improve water quality, if necessary, and ensure availability, storage, and effective distribution
- Install ecologically sound grey and black water treatment and recycling systems, including the possibility for compost production
- Improve drainage throughout the site

- Improve housing stock with an emphasis on sound ecological design that befits the environment
 - Introduce an effective garbage collection system
 - Develop adequate community open spaces for rest and recreation
 - Introduce essential public service facilities including a healthcare center, facilities for the disabled, neighborhood police, a tool sharing “library”, a kindergarten, primary school, secondary school, crafts center, market place, and a regional training facility
 - Develop safe infrastructure
- 2. Create an ecologically sound environmental improvement plan in order to secure the most productive, regenerative environment.**
 - 3. Educate the community on how to implement key soil regeneration processes including proper landscaping, companion planting, composting, irrigation, mulching, grazing, and the like.**
 - 4. Introduce regenerative agriculture practices in order to establish a system that increases yield and adds economic and social value:**
 - Develop an inventory of existing species
 - Establish the species that are most adaptable to the site
 - Establish agricultural products consistent with market needs
 - Train the community members with the relevant practices
 - Establish a seed and plant bank to select and preserve the best phenotypes
 - Create a community greenhouse/nursery
 - Establish an agriculture water management system including water catchment, irrigation and recycling
 - Experiment with regenerative agriculture production systems, such as biodynamic, bio-intensive, hydroponics, aquaculture, food forest design, and others
 - Explore the potential for developing medicinal plants and practices

It should be noted that the first steps in this process, which deal with creating the organizational structure, a task force dealing with land rights issues, and a comprehensive master plan, will likely take significant time to complete. While these activities are moving forward, there are several initiatives mentioned above that can be taken up by the

community and related stakeholders immediately. The Global Sustainability Fellows have already drafted suggestions for activities that can be completed in the short-term. This document is reproduced in full as Resource H.

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7 Appendix

Martina Bustos Field Report

Preparatory Information for the Global Sustainability Fellows Session,
2015

By: Antony Oswaldo Castro Rivera

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Bibliography

Introduction

This report aims to provide an overview of the conditions and present state of the community of Martina Bustos (MB). It is organized according to The Sustainability Laboratory's Five Domains of Sustainability, which serves as a framework for conveying and understanding the complex issues and dynamics of community life. The report and database are follow-up components to The Global Sustainability Fellows (GSF) Program session of 2014, and will inform the activities of the 2015 GSF program session.

The report was additionally informed by the recommendations of Professor Bernard Amadei, of the University of Colorado at Boulder (see Nolan, 2002; Resource B) and under advisement of the Fellows from the 2014-15 GSF program session. A detailed database (Resource A) is the result of a survey presented to residents and leaders of the MB community by Antony Castro and is available for further analysis of community conditions.

The community holds a positive impression of the Global Sustainability Fellows, who have effectively planted the seeds for future partnership. The 2014 program session informed the development of a preliminary Development Plan by the Martina Bustos Development Association for 2014-2016 in partnership with EARTH University, which has built on GSF community organization efforts. This plan has also led to the integration of MB community interests into DINADECO's (Dirección Nacional de Desarrollo de la Comunidad, Costa Rica's national development authority) budget, which has led to several advances in infrastructure and organization within the community, namely the dining hall and its dedicated water reservoir.

That said, major challenges still exist within MB, many of which relate to issues of land titles, gainful employment, home maintenance, water and food security, and care and education of children. The fact that the community is comprised of Nicaraguans and Costa Ricans presents additional challenges, namely lower levels of community integration, and an inability to deal with problems collectively, since members have very different legal statuses. Data collection surveys have received a mixed level of enthusiasm from community members: while many are supportive, others are wary and resistant, as they have not seen the results of previous surveys and do not know what they are being used for.

In all, this report represents an empirical and community-supported effort to characterize the current state of MB and its membership, with the goal of informing future development efforts and building a model for similarly challenged communities worldwide.

Methodologies

Methodology for Gathering Information:

This survey (Resource C) was designed between June 7th and 17th, 2015 using Nolan’s table (2012; Resource B), as well as suggestions from the GSF project team. The surveys were validated with community members in the same month, as privately and confidentially as possible, in order to ensure the best results, and to correct for challenges and errors in the initial interviews. General information provided in this report was gathered through conversations with interviewees, and through further inquiries with the community to clarify the stated diagnoses.

After validating and field-testing the survey, it was offered to 31 residents of the Martina Bustos community who were encountered by the interviewer while walking the MB streets between Mondays and Fridays during the months of June and July. Residents took the survey in their homes. The location of interviewees’ residences in Martina Bustos is illustrated in Image 1.



Image 1: Distribution of interviewees’ homes

After 17 people were interviewed, it was concluded that a question about food sources should be added to the survey. The remaining 14 interviews were conducted with this adjustment. Additional questions were added later and given to the last 11 interviewees.

Methodology for Indexing the Database:

The database generated with the survey (Resource A) was digitized and organized in five clusters: "All," "Adults," "Children," "Housing," and "Personal." All the clusters are traceable by interviewee number.

The "All" cluster contains information applicable to every household member of the interviewee. Adults were asked different questions than children, so individual clusters were generated for each of them. The "Housing" cluster contains information about the locations and distribution of interviewees' homes, along with a mapping of the house itself by room, though other relevant housing information is also included in the "All" cluster. The information in the "Housing" cluster was handled separately due to practical concerns of data organization. The "Personal" cluster includes subjective observations about certain family members, the community, and the environment, which relies specifically on the interviewee's point of view.

Methodology for Utilization of 2015 Census (Resource F):

The surveyor obtained the 2015 Census during its presentation to the community in July, translated it from Spanish to English, then generated accompanying graphics. The Census was conducted with a representative from each of MB's 466 families. Due to the international diversity of the GSF team, the original currency (colones) was converted into dollars for this document for better comprehension. The currency conversion rate used was USD 1: CRC 530.

Editor's Note: This survey was conducted by an EARTH University graduate who was a participant in The Lab's Global Sustainability Fellows Program. Factors such as time and resource constraints resulted in some questions having a limited sample size. Therefore, this survey should not be considered exhaustive, but rather a starting point for further analysis.

1 Material Domain

1.1 Environment

The Martina Bustos (MB) community is located in the northwest of Costa Rica, in the province of Guanacaste. One hundred kilometers separate Martina Bustos from the international border with Nicaragua.

MB was formed more than 25 years ago on private property held by Jose Joaquín Muñoz Bustos (Resource D). Martina Bustos is located to the northeast of Liberia, the principal city of the Guanacaste province, and it belongs to Liberia’s canton. It is represented by the blue outline and white arrow on the map below. The easiest route to MB from Liberia is to enter the Nazareth community and follow the red highlighted route into the community borders.

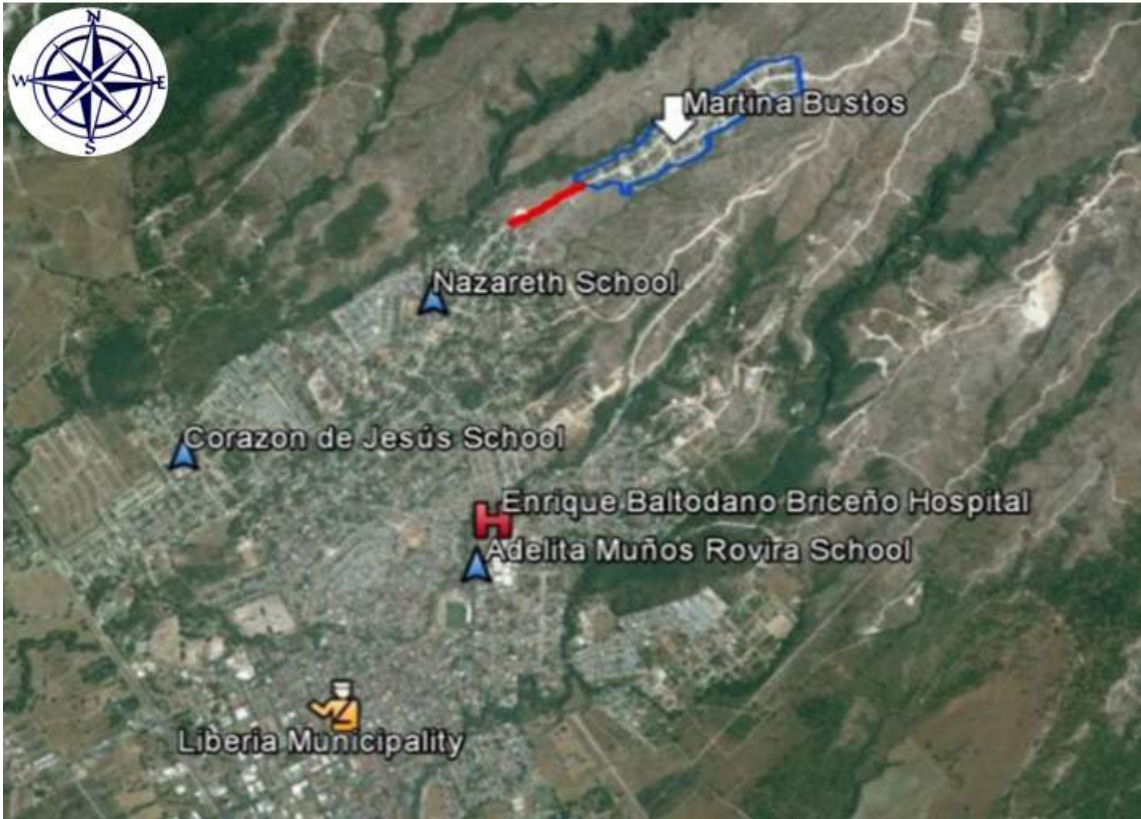


Image 2: Liberia Town Map, showing schools, hospitals, town hall and Martina Bustos

There is variable topography throughout MB. The east side is the highest area, and there are two main depressions resembling channels along the north and south (purple borders

of the community). The X and Y markers in Image 3 are the boundaries of where homes are found along the main street.

Measurements made with Google Earth provide the following results:

- *Area:* 0,1 miles² / 0,24 km² / 292.449 yards² / 24,5 hectares
- *Perimeter:* 1,98 miles / 3,19 km / 3.486 yards
- *Distance X → Y:* 0,77 miles / 1,24 km / 1.356 yards
- *Length of entrance (red line):* 0,27 miles / 0,43 km / 470 yards

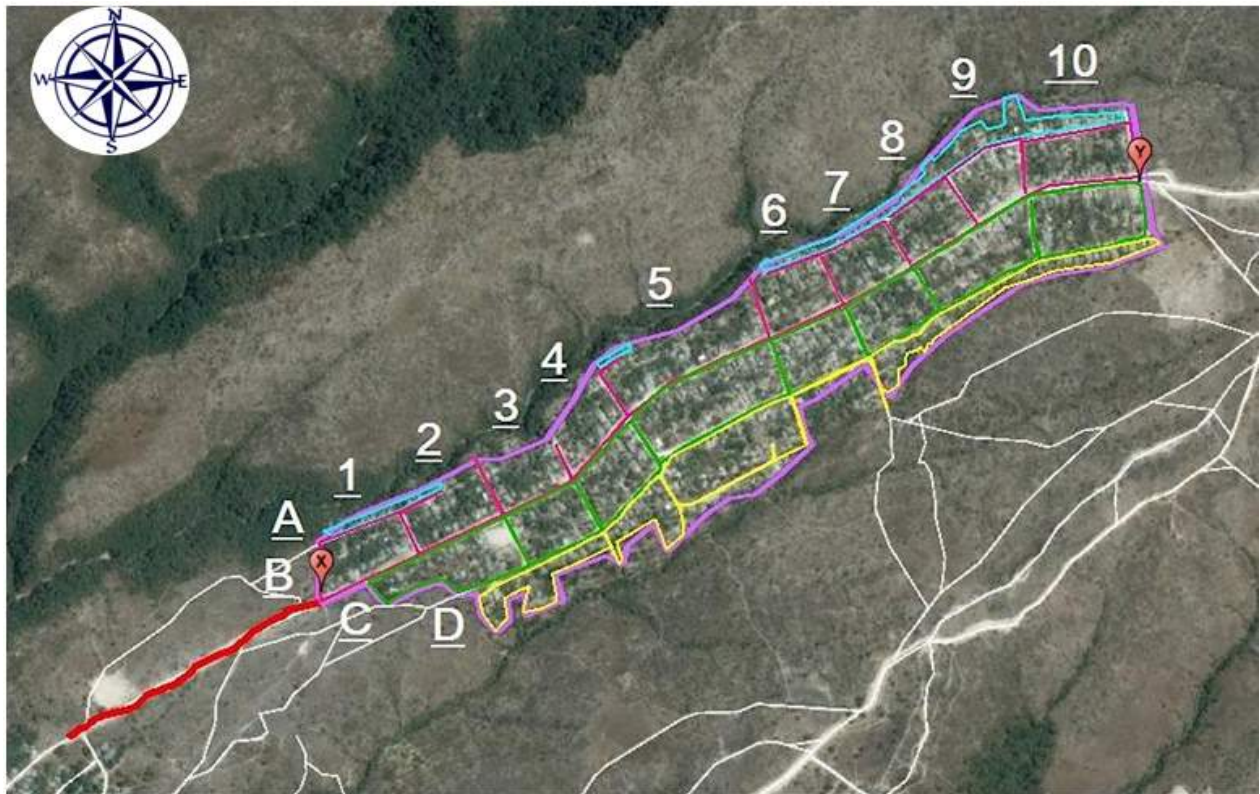


Image 3: Geography of Martina Bustos

1.2 Climate

Martina Bustos shares Guanacaste's predominantly dry, tropical climate. Details concerning temperature and rainfall patterns can be seen in Table 1, below.

Month	Average temperature				Total average rain (mm)	Average days with rain
	°C		°F			
	Min	Max	Min	Max		
Jan	20.7	33.4	69.3	92.1	1.3	0
Feb	21.2	34.4	70.2	93.9	1.7	0
Mar	21.6	35.4	70.9	95.7	4.2	0
Apr	22.7	35.9	72.9	96.6	24.7	2
May	23.4	33.9	74.1	93.0	198.4	12
Jun	23.2	32.0	73.8	89.6	247.4	18
Jul	22.8	32.1	73.0	89.8	157.3	14
Aug	22.6	32.1	72.7	89.8	210.9	16
Sep	22.4	31.3	72.3	88.3	360.5	21
Oct	22.3	30.9	72.1	87.6	327.1	20
Nov	21.5	31.6	70.7	88.9	102.4	9
Dec	21.0	32.5	69.8	90.5	10.9	3

Table 1: Climatological data for Liberia over the last 10 years (IMN, 2015)

The data in Table 1 represents the average of 10 years of recorded climatology information and does not represent the specific climatology of the last three years. In the last three years, Guanacaste has suffered from pronounced drought, which has not been seen in the area since 1937 (La Nacion News, 2015; CR Hoy News, 2015).

2013 registers show the complete lack of rainfall in July, making Liberia the regional location with the most serious drought. By the 1st of June, 2015, meteorological stations reported just 1.3mm of rain. This resulted in serious losses at sugarcane plantations and cattle ranches in Guanacaste, with severe financial repercussions for those in the industries (La Nacion News, 2015; CR Hoy News, 2015).

These conditions are challenges to agricultural development; should food production initiatives be a goal for future development, careful water management will be required.

1.3 Edaphology and Soils

Martina Bustos is built upon a rocky, albite mineral deposit/compressed sandy-clay entisol lookalike. The limestone potential is currently being studied by EARTH University as a potential silicon fertilizer for monocotyledoneous plants, which would make them more pest-resistant. Albite's extractable silicon oxide (SiO) is about 120ppm (Castro, 2015) and the total content of silicon dioxide is about 74.40% as reported by Varela and Velazquez (2014).

Compound	% in Calcined sample	% in Fresh sample
Silicic dioxide	74.40	70.83
Aluminum oxide	16.98	16.16
Iron oxide	1.81	1.72
Calcium oxide	0.61	0.58
Magnesium oxide	0.18	0.17
Sodium oxide	1.59	1.51
Potassium oxide	3.80	3.62
Titanium oxide	0.29	0.28
Manganese oxide	0.06	0.06
Phosphorus pentoxide	0.02	0.02
Strontium oxide	0.02	0.02
Barium oxide	0.21	0.20
Sulfur trioxide	0.01	0.01
Humidity		1.16

Table 2: Chemical composition of deep undersoil in Martina Bustos (Varela and Velásquez, 2014)

The mineral compound is a regolitic parental material compound of feldspar (probably albite) and quartz, as determined by Gonzalez and Mendez (2014). Their methodology consisted of collecting seven samples of MB mineral material and analyzing them with Melich (III). They described the soil as having very low nutritional levels making it somewhat inappropriate for many food crops, however temporarily. Not toxic levels of arsenic, cadmium, chrome, copper, mercury or molybdenum were also found. As such, they concluded it could be used with organic fertilizer.

Two analyses concluded that MB's soil has low nutritional content for agronomic establishment if used alone as a substrate. This may be true thus far, however an appropriate biochemical environment for plant life could emerge with time with correct composting and other soil-enhancement techniques (Varela and Vasquez, Gonzales and Mendez). An elderly man mentioned during an interview that he knew how to plant corn and beans, and he said he believed that with a backhoe, it would be feasible. Four people have said that tilling the soil turns it into well-structured soil for planting things like cassava, which they have harvested, in good quality, numerous times. Figure 1 shows isolated particles of less than 325 mesh of MB ground material, which corresponds to 10% of the total composition of the ground material. This is the part of the soil with the most prominent physical characteristics for development of silicic fertilizer.

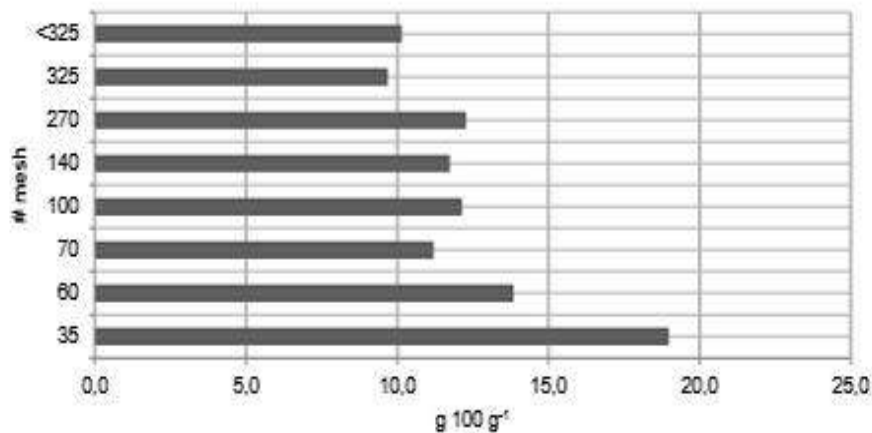


Figure 1: Average distribution of particle sizes (Gonzalez & Mendez, 2014)

Ultimately, it is important to note that while dry, the land of MB has reasonable potential for healthy food production given appropriate forms of agricultural and soil development.

1.4 Diet and Food Supply

Of the 31 people interviewed, 26 said that they had three meals per day. Three respondents said they ate three meals per day only when money permits, while two said they did not eat three meals per day. Among the 26 who said that they ate three meals per day, there were several instances of a child interrupting to say that it was not true. This leads the surveyor to conclude that this question may be influenced by respondents' shame of not having enough resources to eat appropriately. It's also possible that residents have a depressed appetite, due to slow rates of metabolism in relation to high midday temperatures (>30°C; 86°F).

Children reported to sometimes not eating breakfast at home. When the surveyor told them about the opportunity to eat at the school's dining hall, two children criticized the taste of dining hall's food ("It's gross").

Respondents reported their diets to consist mainly of the following:

Breakfast: Bread, coffee, gallo pinto (spiced and mixed rice and beans), egg*, tortilla, custard, sausage, fruit, cookies, cereal

Lunch and Dinner: Rice, beans, chicken*, cheese, plantains, avocado, tuna*, beef*, pork*, salad, pasta, soup, potatoes, tomato, onions

* When resources permit.

Some respondents preferred to buy most of their food at the grocery stores inside MB, where prices are sometimes inflated. Others reported traveling to Liberia periodically to get better prices, and buying in local grocery stores only when purchasing staples like milk, which cannot be stored for long periods of time.

With a dearth of economic resources, as well as other challenges related to food accessibility, there is a good indication that a system of food production/improved accessibility would aid the community. It is important to consider how this might affect the business of food stores in MB, though this could be mitigated by diversifying economic opportunities, and by selling locally produced goods in stores. Greater variety would also provide vital nutrients, vitamins, and minerals to community members' diet.

1.5 Access to Water

Lack of water access is one of the main issues reported by community members. This problem stems mainly from MB residents' lack of property titles, which is a primary condition for gaining a legal and viable pathway to granting the installation of water service to private homes. Without property titles, it is impossible to segregate bill charges by household, as the whole property falls under just one property title.

Fountains in Martina Bustos

In 2008, a water tap was installed in the western part of the community, beginning at the western end of the red line in Image 3. MB residents walk from their homes to these public water taps to fill their containers for domestic use. Between 2008 and 2009, the government installed approximately 8 to 10 water taps along the main street.



Image 4: Means of water access in MB

Image 5 illustrates the location of eight formal water taps (yellow icons) and nine informal water taps. Water is distributed as follows: groundwater is collected from a pump well located in Nazareth (a community to the west, at the beginning of the red line in Image 5) and sent to a container located at the Y icon in Image 5 (a higher point in the community). Pressure and gravity determines the amount of water released from the different water taps, with the newer, informal fountains rendering the original system incapable of providing water to every fountain.



Image 5: Martina Bustos water fountains (formal: yellow / informal: blue)

Distances between the formal fountains (F), from west to east, according to Image 5 are:

F1-F2: 120m; 393ft F2-F3: 100m; 327ft F3-F4: 140m; 459ft F4-F5: 146m; 479ft
 F5-F6: 148m; 486ft F6-F7: 156m; 523ft F7-F10: 340m; 1115ft

Communal Rules to Regulate Access to Water

Due to the topography, the informal water taps, which are connected “illegally,” also hinder and obstruct the flow of water from the formal system. Many MB residents tend to accumulate or “hoard” water, which also influences the availability of water flow throughout the rest of the day, often leading to water shortages. Water is mainly available at night, which means residents must wake up early to fill up their containers. MB residents report that they have tried to reach the water service institutions to report breakdowns or troubles with the formal water tap system, but to no avail; they are placed on hold for an indeterminate amount of time until the call drops.

MB residents who have the chance to connect their hose usually leave it connected, so when water comes in, they can store it (see Image 4). However, if someone needs to connect his or her hose, having learned that water has arrived, taking out another person's

hose is considered acceptable behavior. Lines for filling the receptacles are generally respected.

Rain Catchment Systems

Rain collection is not a common practice in MB: only a few people do it, and the water they collect is usually used only for washing clothes or dishes, not for cooking or drinking. There are no complex systems to collect rainwater; residents simply leave containers near the end of the roofs where water falls. However, the surveyor noticed two complex canalization systems: In the first, the owner placed a bent zinc sheet at the end of the roof, in order to guide more water to a container at the end. The second did the same but had two containers, one which had a fabric filter to treat water that passed into the final container. In conclusion, it is clear that water access is a critical concern for the MB community. Members identify this challenge as among the most pressing, and observationally, the surveyor concludes that it presents a major challenge to community infrastructure and group cohesion.

1.6 Sewage and Trash Collection

There are no sewage structures in the community, nor are there any trash pickup services. The 2015 Census revealed that every road of MB has been declared public by the authorities; thus if the landowner pays the land taxes, there should be trash pickup service. Since he has not been paying the taxes, there is no trash collection. Currently, the community association, with the help of governmental contacts and NGOs, is trying to advocate for trash collection services (see point 2.6.2).

Related Environmental Risks

87% of respondents said that they did not consider themselves to be exposed to environmental risks. However, respondents did report significant issues with trash management. Due to the lack of a trash collection service, the community has adopted two methods of waste disposal: burning and burying. Wind carries the toxic fumes from burning plastics and other waste towards community homes and even into the community dining hall where children congregate and eat. Burying trash also presents a problem, specifically at the northern and southern limits of the community, where homes sit alongside ditches that are routinely used for garbage disposal. In these areas, waste is sometimes simply thrown out in piles without burial.



Image 6: Examples of waste and burnt plastics

A third option for trash disposal is to give recyclable materials to either of the two recyclers who pass through the community from time to time, picking up trash, often not well-separated, in a truck. The recyclers then bring these materials to a recycling center, where they can receive a payment for the recyclables.

Material Domain Conclusions

There are processes in place in the community to deal with and support basic human needs, however current infrastructural constraints are preventing further growth and development. Particular areas for intervention relate to water access, food quality, trash collection, and land use and restoration.

2 Economic Domain

2.1 Employment and Labor

When asked about economic responsibility in each home, 123 people who lived in a couple answered that either the man or the woman was the primary breadwinner, 290 people who lived in a couple answered that both members shared financial responsibility, and 53 people answered that they are single and must support themselves (Figure 2).

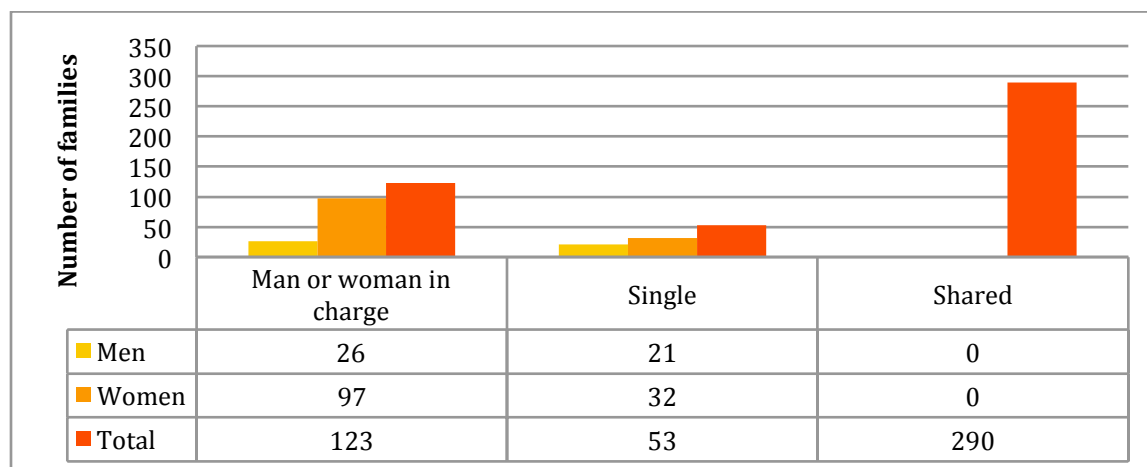


Figure 2: Families according to economic responsibility in the house (Census 2015)

Of the 466 people interviewed, 70 respondents reported they work in their own homes, 68 work in independent businesses (e.g. grocery stores, street sales, construction work), 81 reported having occasional work opportunities or working odd jobs, 95 are unemployed, 63 have permanent, salaried employments, 9 are pensioned, 1 person is a priest, 10 people reported working in the homes of others (e.g. domestic helpers, gardeners, etc.), 41 respondents work in recycling, 1 is working as an artisan, and 27 respondents did not answer. In addition to the glaring unemployment rates in MB, it is clear from this survey that a significant number of members of the MB Community are now engaged in occasional, informal, and non-permanent employment. It is clear that developing human capital potentials will be a significant part of the GSF Development Plan with the MB community.

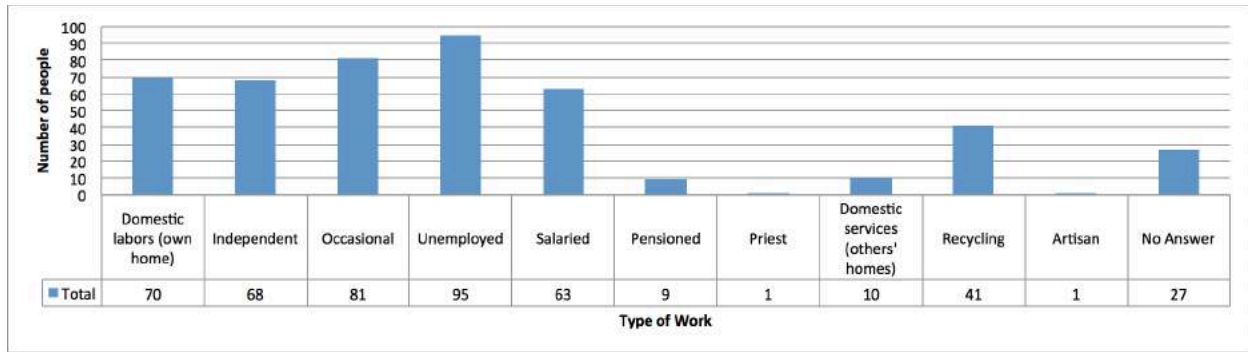


Figure 3: Types of work among interviewees (Census, 2015)

Figure 4 reveals that an alarming 43% (202 families) of families in Martina Bustos reported having no income at all. 53% (247 families) reported earning under \$568 per month, and 3.7% (17 families) reported earning more than \$568 per month.

The surveyor observed that within the MB community, there are 10 grocery stores in an area of 0.1 miles² (0.24 km²), which represents substantial competition. Still, prices in these stores are noted to be higher than those in Liberia.

An important point to add is that the local garbage dump, which acts as a major source of income for MB residents, as reported in the Census (Resource F), has been in a closure process since 2014. Residents prefer not to discuss openly their reliance on the dump, as there are significant challenges surrounding this form of labor; it is poorly regarded, often unsanitary, and technically frowned upon by the government. However, at the time of writing, August 24th, 2015, the dump was still operational. Thus, it is unclear when it is actually going to be closed, as closure has been postponed many times.

Plantation work was also often reported as an income source for MB's laborers. This vocation is seasonal and dependent on rain patterns in Guanacaste. Most of this work is related to melon field plantations or their packing plants. Residents reported employment at an aloe plantation as well, working as field pickers for half of the year.

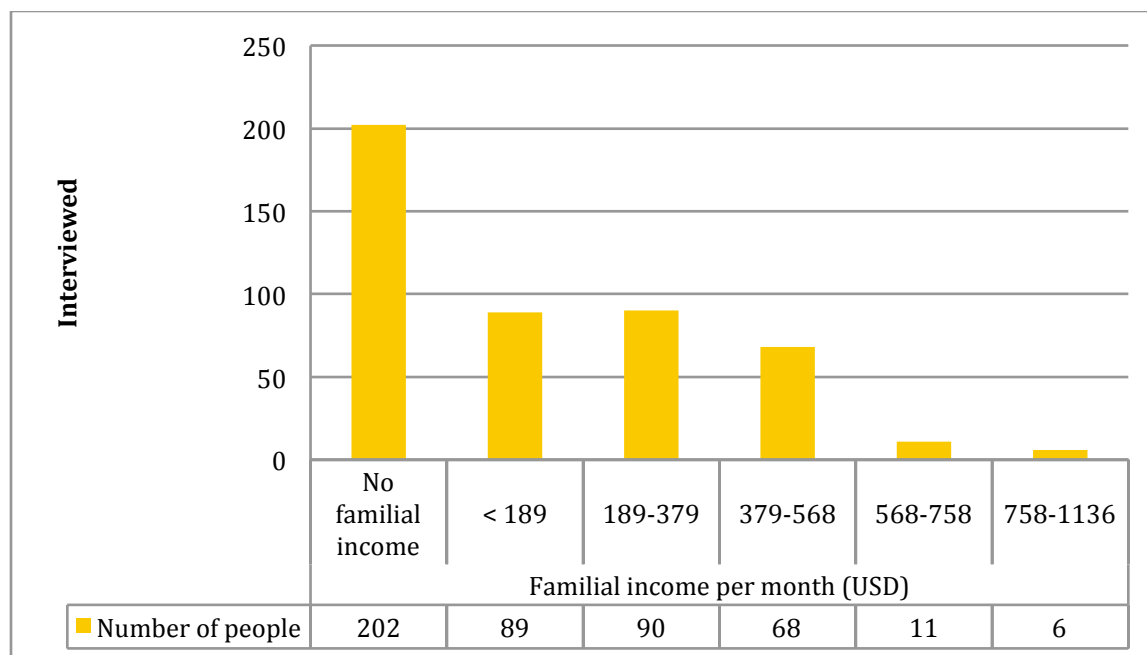


Figure 4: Income of families interviewed (Census, 2015)

It is clear from this survey that there is significant room for job development in the MB community. While some families are able to sustain themselves, others are at-risk of living in conditions of extreme poverty, which can lead to further health and crime issues within the community.

2.2 Land Property Titles

Legal pathways for Martina Bustos residents to get ownership of their homes

Community members may be able to receive property titles under Costa Rican law, which allows people to take ownership of land they have occupied for five years. A major obstacle for residents in the past, even those who have lived on their land for five years or more, has been the prohibitive cost of obtaining a lawyer. A secondary issue is that some residents have lived on the land for less than five years (Figure 5). Another complication is that many of MB's residents are Nicaraguans living illegally in Costa Rica (Figure 10). The latter has been used as an argument by authorities to forego action, as it complicates the possibility of covering residents under Costa Rican land rights laws.

Some interviewees cited the legal right of occupation as the preferred method of solving the land title issue. This is because residents believe that if the land passes to the Costa Rican government, residents will be relocated to a social development project in a less-preferable part of Costa Rica. Additionally, the issue of whether the legal owner has already

donated the land to the people is complex from a legal and political standpoint; the status of this claim is ambiguous and will take further investigation in order to confirm and resolve. One challenge of quantifying years of occupancy is that in some cases, whole parcels of land have been further subdivided through sale. For example, one family owns a 400m² section which is then divided and sold as a two 200m² sections; or parents pass a section to a son or daughter upon marriage.

In 2013, with the assistance of a Costa Rican migration entity and the Nicaraguan Consulate, members of the Martina Bustos community received information on legally establishing in Costa Rica. A considerable number of community members were able to get their documents in order, but some still remain undocumented and are considered illegal immigrants.

Years of Land Possession

The Census (Resource F) reveals that 325 of the 466 people interviewed have held land in MB for more than five years, as can be seen in Figure 5, which makes it viable to cover them under the Costa Rican land possession laws. However, there are also 113 people which have occupied the land for less than four years, and 28 which did not answer.

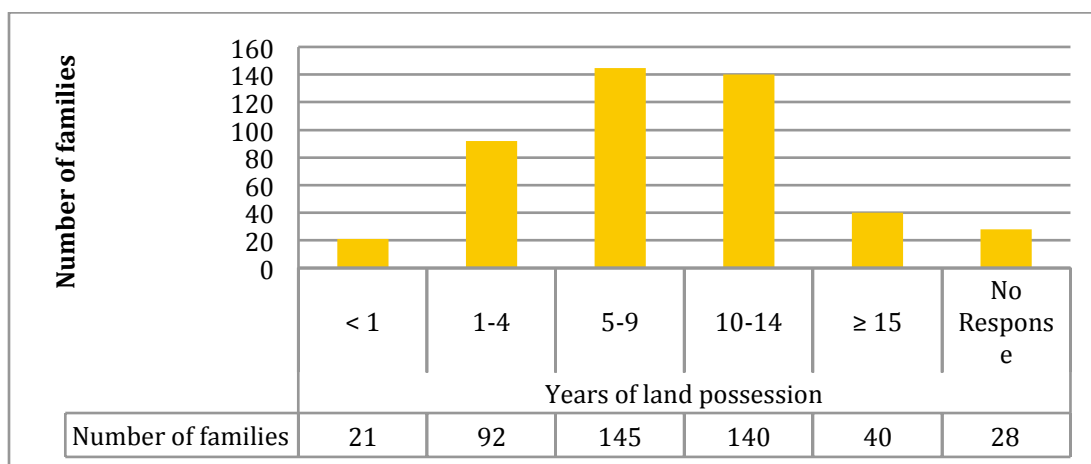


Figure 5: Families in MP sorted by years of land possession (Census 2015)

The community's perception of the legal titles issue

A contact from the University of Costa Rica who worked with the community for three years said she believes that if residents gain legal possession of the land, they would sell it and move to similar conditions elsewhere. This is an indicator that there are multiple concerns about community members' long-term commitment and willingness to invest in obtaining land titles.

The surveyor has also perceived that the Development Association members are regularly put to new elections, which atrophies advances made on water and land ownership issues. Some believe that the water and land problems will not be solved until they are of old age, and are therefore anxious to leave the area soon.

Conclusions for Land Title Issues

Land titles are a critical concern for the community, and given the significance of the challenge, is a fundamental point for future development efforts. Clearly, some avenues towards land ownership are available, but dedicated research is necessary to determine how to appropriately address the issue.

2.3 Transportation

The bus to Liberia costs about \$0.64. It passes once an hour, and takes 20 to 30 minutes to complete the route to Liberia, at which point it loops back towards Martina Bustos. Point Y on the map depicts the first and last stop on the route. Interviewees reported that the bus used to cost \$1.10, which meant that some preferred to walk, however the price has apparently changed. Interviewees have noted that the bus is often late, which is especially problematic for those who go to work very early. Interviewees also complain that sometimes bus drivers do not stop, and that there is a bus driver who treats MB residents poorly. On Sundays there is just one bus per route, and so waits tend to surpass the usual hour.

It is a strong possibility that improved transportation access will benefit the community in a variety of social and economic ways, including access to jobs, educational opportunities, and neighboring communities.

2.4 Access to Electricity

Electricity has been available in MB for around 15 years; any household can simply request the service and pay their monthly bill. Unlike the water service, the electricity company does not require a property title to provide services due to a difference in their internal code. Street lighting infrastructure is already present in MB, which is an indication that the streets have been deemed “public” by the authorities. Despite the availability of electricity, both streetlights and home lighting has very poor electrical infrastructure, due to makeshift installations and lack of resources for repairs.

Information gathered from surveys revealed that some families pay enormously high electricity bills. An electricity expert invited to the August 17th, 2015, GSF/MB community

meeting indicated that high electricity bills might stem from bad electricity infrastructure or electricity meters improperly sharing consumption rates between homes.

Economic Domain Conclusions

The combination of land rights issues and legal barriers to normal implementation of electricity create a fundamental set of negative scenarios within MB. These are among the core critical issues faced by the community and should be part of any major infrastructure plan. These issues also appear to be a point of consternation within the community. Their resolution could therefore result in better overall inter- and intra-community relationships, providing opportunities for renewed confidence by removing fundamental barriers to positive growth and change.

3 Domain of Life

3.1 Trees in Martina Bustos

The surveyor recorded the following species of **fruit trees** in MB:

Coconut	<i>Cocos nucifera</i>	Arecales: Arecace
Papaya	<i>Carica papaya</i>	Brassicales: Caricaceae
Noni	<i>Morinda citrifolia</i>	Gentianales: Rubiaceae
Avocado	<i>Persea americana</i>	Laurales: Lauraceae
Guanbana	<i>Annona muricata</i>	Magnoliales: Annonaceae
Zapote	<i>Mammea americana</i>	Malpighiales: clusiaceae
Nance	<i>Byrsonima crassifolia</i>	Malpighiales: malpighiaceae
Guava	<i>Psidium guajava</i> L.	Myrtales: Myrtaceae
Tropical almonds (almendro de playa)	<i>Terminalia Catappa</i>	Myrtales: Combretaceae
Mango	<i>Mangifera indica</i>	Sapindales: Anacardiaceae
Lemon/Oranges	<i>Citrus</i> spp.	Sapindales: Rutaceae
Jocote	<i>Spondias purpurea</i>	Sapindales: Anacardiaceae
Cashew	<i>Anacardium occidentale</i>	Sapindales: Anacardiaceae
Sweet passionfruit (granadilla)	<i>Passiflora ligularis</i>	Violales: Passifloraceae

Table 3: Fruit trees currently present in Martina Bustos

Furthermore, most homes have native and non-native potential timber trees. Some of those reported are:

Gliricidia (madero)	<i>Gliricidia sepium</i>	Fabales: Fabaceae
Evergreen oak (encino)	<i>Quercus ilex</i>	Fagales: Fagaceae
Poró	<i>Erythrina</i> sp	Fabales: Fabaceae
Royal Poinciana (malinche)	<i>Delonix regia</i>	Fabales: Fabaceae
Beechwood (melina)	<i>Gmelina arborea</i>	Lamiales: Lamiaceae
Oak (roble)	<i>Quercus</i> sp.	Fagales: Fagaceae
Guanacaste	<i>Enterolobium cyclocarpum</i>	Fabales: Fabaceae

Table 4: Non-fruit trees currently present in Martina Bustos

3.2 Gardens in Martina Bustos

Flower pots and home gardens can be found in many households. Though these cannot be considered developed gardens, the occurrence shows an interest in cultivation of some

kind. In the future, flowerpots could be used as a source of seeds. Given the soil composition of MB, the use of standard agricultural practices would be impractical.

MB residents reportedly planted plantains, bananas, cassava, tiquisque, rice and sugarcane in their gardens. Sweet potato (*Ipomoea batatas*) and pipian (*Cucurbita argyrosperma*) were also reported, but only during the rainy season.

It is notable that five lead members of the MB Development Association practice hydroponic agriculture as taught to them by EARTH University. This activity has great potential: its adoption within the community can mean advances in self-sufficiency. For example, the hydroponic mineral solutions that residents buy cost \$6 per liter, but can be made by residents for less than \$.05 per liter.

Martina Bustos has the potential to grow diverse native and non-native trees using non-standard agricultural practices. Some residents already use trees and plants grown in home gardens to supplement their diet, a fact that could be built upon in a larger food security effort. Previous efforts by EARTH University and Martina Bustos residents have demonstrated the feasibility of such a project. Due to the relative low cost of such a project, there is willingness among the community to collaborate.

3.3 Pets and Livestock in Martina Bustos

It is common for residents to have pets: most have dogs, though some have cats. When veterinarians come periodically to offer castrations, most pet owners do not oblige. This offers an explanation for why there are many starving puppies in the streets of the community, many of which die. It is not typical for residents to keep livestock, though the surveyor did spot some roosters and chickens in home areas and along the streets. Some of these animals are used for food. There is at least one livestock breeder in the area. He dedicates his days to finding food for his 20 pigs, which he collects from various sources including from residues left by a local agriculture fair, and pulls in a cart on the back of his bicycle. He also works with horses and cows on another person's farm.

To conclude, the animals found in Martina Bustos include dog and cat populations, endemic species of reptiles, and some isolated cases of livestock development. Livestock operations seem feasible for Martina Bustos, and one case showed there may be opportunities for turning waste into feed, a valuable exchange item for external communities.

4 Social Domain

4.1 Migration-driven community

Regional and National Context

Central American migration is often driven by labor needs. This is the case in Martina Bustos, a community formed mainly by Nicaraguan migrants looking for better income. Although Costa Rica does not have the highest immigration rates in the region, together with Panama, it receives 85% of the interregional migration.

For Costa Rica, this signifies a transit immigration flow from South America to the United States, and a fixed immigration flow from Nicaragua and Panama.



Figure 6: “Los corredores del riesgo en Centroamérica” by FLACSO Costa Rica (Morales, 2014).

The agricultural services and markets opening, along with low regulation in said labor markets have led to immigrant settlements in cities close to regional borders, known as interregional corridors. The conditions of the immigrants are characterized by obstructions to channels of justice and human rights and rampant discrimination, as well as the lack of labor rights and social services. This is also the case in Martina Bustos.

Martina Bustos: Context

Martina Bustos was created 25 years ago on private property comprised of 23 hectares of limestone land. The original owner “Martina Bustos” wanted this place to be used by low-

income immigrant families. By 1997, 30 families already lived there. Now, in 2015, there are almost 500 families.

According to the Census (Resource F), the families are at risk of displacement, given that legal land property rights were never given to the inhabitants. State institutions do not offer classic services such as street maintenance, as the area is formally considered private property.

As aforementioned, more than 325 families of the 466 interviewed for the Census have lived in MB between 5 and 15 years or more, and 21 families have been living there for less than one year. The data suggests two main kinds of residents in Martina Bustos: temporary and permanent.

During this survey process, residents were asked whether or not their aim was to settle down in Martina Bustos. The results showed that out of a total of 31 residents, 29 expressed their desire to settle down there, while only two reported a plan to move.

Although this seems to point to a general desire of residents to establish their life in Martina Bustos, the surveyor also learned from community members that families might report a desire for permanent residence in order to avoid being considered a transient by state institutions, as transient and immigrant status decreases the likelihood of receiving formal land rights and access to basic services. Another important consideration is the possibility that, regardless of how long residents have been living in Martina Bustos, the latent desire to leave for a better place continues to exist in the mind of residents. This could mean that the lack of community cohesion as well as the abandoned infrastructure could be partly rooted in the behavior of the community itself and not just an institutional failure.

Many residents have expressed that receiving their land rights title would be the greatest incentive to become active in community development projects. The following sections offer a deeper exploration of the social issues present in Martina Bustos.

4.2 Demography

The Census (Resource F) revealed that by the beginning of this year there were 466 families in MB, which translated to 1,743 individuals. The ratio of adult men to women is 51% to 49%.

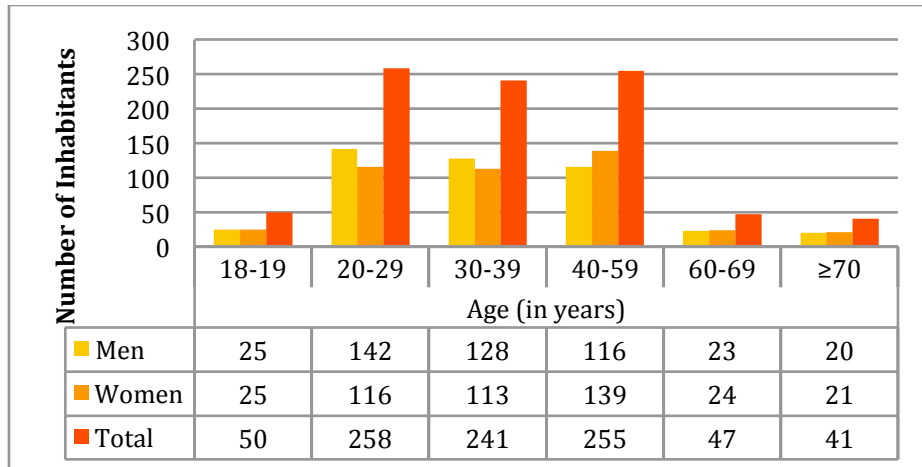


Figure 7: Inhabitants of MB by age (Census, 2015)

In MB, 851 residents are under the age of eighteen, representing 49% of the total population. The age distribution among the underage population is illustrated in Figure 8.

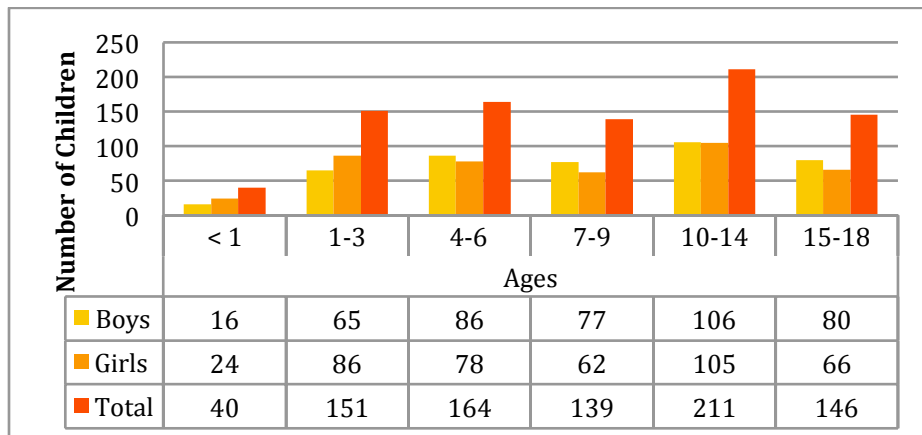


Figure 8: Age distribution of underage population (Census, 2015)

As illustrated in Figure 9, of the 466 family representatives interviewed, 53% (247 families) are composed of two or three members; 34% (157 families) are composed of four to six members; 7% (32 cases) are composed of a single person; and 4% (17 families) are composed of seven or more individuals.

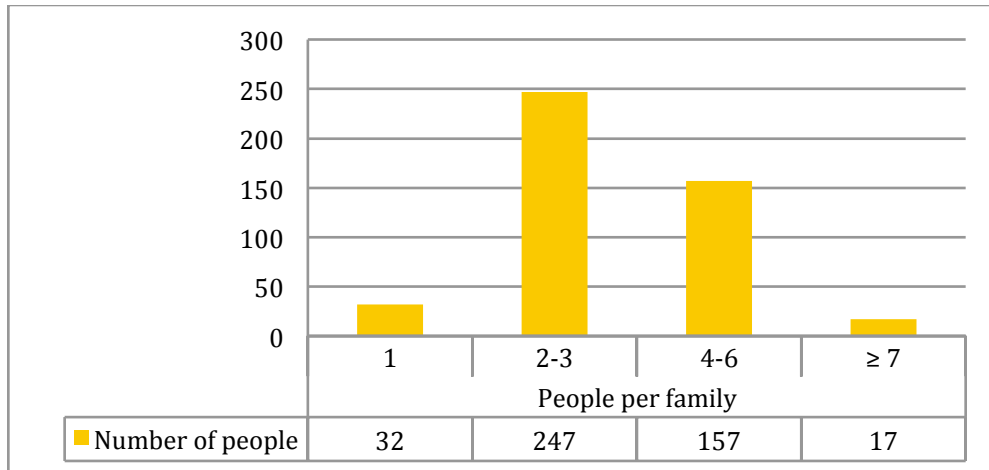


Figure 9: Families sorted according to number of people per family (Census, 2015)

As aforementioned, about half of Martina Bustos’s population is under 18 and, according to the data, this number seems to be increasing. If the birth and death rates persist at similar rates, in five years the population of MB will be 1950. Infrastructure and social facilities should be built in order to attend to this growing population of children and young people. Family planning methods should be considered.

4.3 Legal Status

During the 2015 Census, census workers requested identification documents to confirm the 1,743 people previously reported by surveyed family representatives. There are more “residents” than Costa Ricans, making this the most common legal status amongst MB residents (Figure 10). However, a further investigation reveals that most of this population qualifies as legal residents, covering them under Costa Rican law, and possibly easing the path towards land acquisition rights (see section 2.2). Additionally, those with foreign passports, those with no papers and those who did not answer (due to possible legal issues) can become residents by entering into a process with the Costa Rican Migration entity and the Nicaraguan embassy, the same bodies which collaborated in 2013 to resolve these complicated issues (see last paragraph of first subtitle in section 2.2).

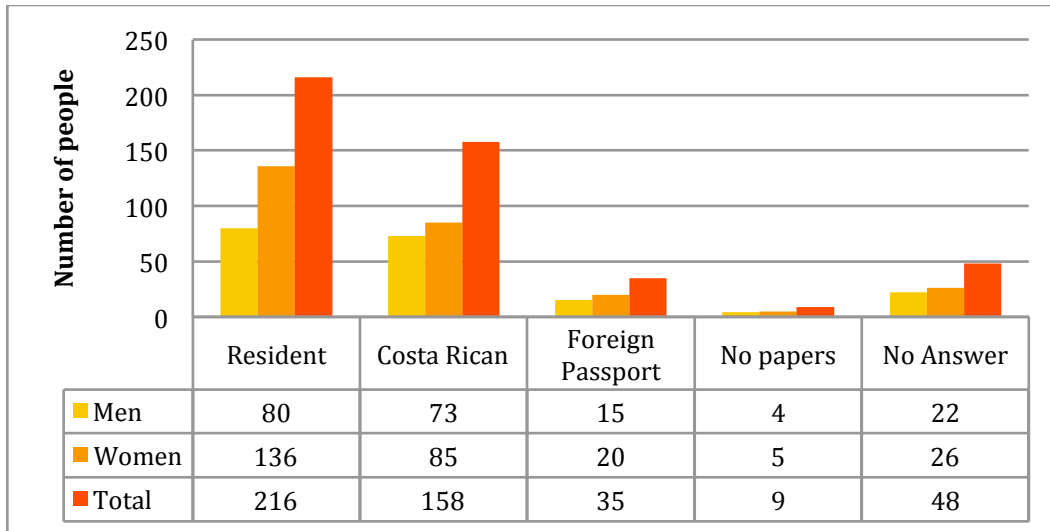


Figure 10: Population in MB by legal status (Census, 2015)

Although most of the residents have had difficulties in obtaining legal status, which in turn affects their ability to gain formal employment, national and international regulations point to pathways to overcoming their migratory status.

4.4 Education

Quantity and Distribution of Students

According to the 2015 Census, of the 851 underage residents, 483 are studying (240 boys and 243 girls), 16 are not studying, and the rest are under the age of six, which is the age in which students matriculate into grade school. The census explained that there are two males between 9 and 10 years old and five males between 16 and 17 years old which are not attending school. In addition there are six females between 16 and 17 years old, and three 15-year-old females not attending school.

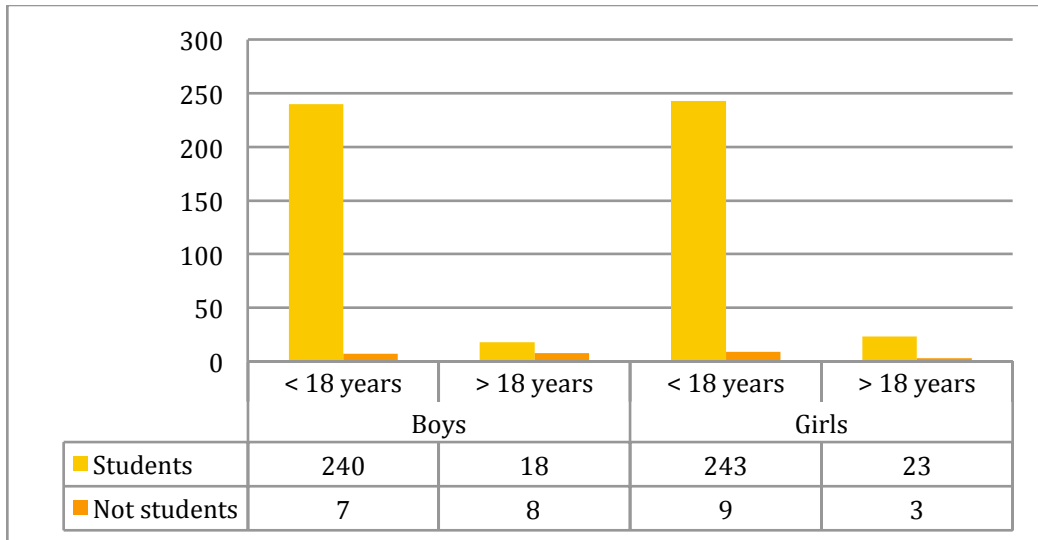


Figure 11: Students vs. non-students among young people in MB (Census, 2015)

Also, the census reports that 11 adults (8 men and 3 women) are still studying in high schools past the age of 18. This may be due to the adult students repeating grade levels or reentering school after taking time off. It is important to mention that I.N.D.E.R. (Rural Development Institute), a public organization, offers \$120 per month to sponsor adults who decide to finish their high school studies.

School Schedules

Primary school schedules run Monday through Friday, from either 7:00am to 12:00pm or from 12:00pm to 5:30pm, depending on the school.

Schools and School Buses

Students from interviewed families attend Nazareth, Corazón de Jesus or Adelita Muñoz for grade school, and Technical Professional Agricultural High School, Aplicación Alba Ocampo Alvarado or Guanacaste's Institute for high school.

There is a free public bus which only serves high school students, and does not go to grade schools. Nazareth school students usually walk 1.1km (0.68 miles; 1.197 yards) from their homes to attend school. Students of other grade schools tend to use a public bus or private transport. When walking, students travel to and from school in groups, with other students or with their parents. Some walk alone or take the public bus; a few others go by bicycle.

Interviewees did not feel that the Nazareth school provided a good education. They reported frequent fights at this school, and said that educators pass students year to year

who do not meet the minimum passing requirements. This is the main reason why some parents have decided to send their children to schools further away.

Internet

There are few practical opportunities for MB residents to gain access to the Internet on a computer, except for in school computer labs. Although almost no one in MB has a home computer or a landline for a dial-up connection, it might still be possible to pay for Internet installation in community homes through their cable provider for use on their smartphones. There are also Internet cafes available in Liberia, though there aren't any in MB.

Summary

Martina Bustos is a community with a young demographic profile. The majority of the youth attend the nearby school. Infrastructure and facilities are poor and present major daily difficulties for the families, who are seeking to make the best of the limited time and resources allocated to educational activities.

4.5 Criminal Offenses

The red highlighted line in Image 2 and 3, which is 0.4 km (0.24 miles) long, represents the community's main source of insecurity, because it is an isolated area where there have been cases of theft in the early morning and at night (this is why students at Nazareth walk to school in groups). There was also a confirmed case of an eight-year-old girl who was taken from that road and raped in 2009; the girl's family has since returned to Nicaragua. As of February 2015, another girl around the same age also reported an attempted rape.

One interviewee stated that thieves, in groups or alone, break the streetlights in order to trap victims and threaten them with knives or guns. The street (see Image 7, below) looks like an underground passage between two walls, one at each side, which are of above average height, so that there is nowhere to run if threatened, nor anyone to call to for help, as it is isolated from nearby houses.



Image 7: Road where criminal activity has been reported

Interviewees report that the most commonly stolen goods are water receptacles and hoses that are left outside homes. Theft of a motorcycle has also been recorded. Clearly, there is also a risk of construction materials being stolen if left without surveillance, which may be a factor in the logistics of social investment in the neighborhood.

Poor infrastructure provides opportunities for criminal activity in Martina Bustos. Illegal drug and alcohol distribution and consumption, among other social factors, threaten security in the community.

4.6 Illicit Substance Consumption

Only one interviewee indicated that her son consumes marijuana. Though she was a bit embarrassed, and concerned about the influence on her younger son, she did not seem to consider this fact a disgrace.

Additionally, sectors 7, 8, 9 and 10 (Image 3) have been reported as problematic, especially due to the proximity of homes selling illegal liquor, which is consumed nearby at night. Drug consumption on these corners has also been reported and observed by the surveyor. Sectors D 7, 8, 9 and 10 (Image 3) also contain houses that have been robbed while no one was at home.

Residents in Martina Bustos have said that drug consumption is increasing. Selling points have been spotted in the area. There is currently not enough information or data to prove this perception and analyze trends.

4.7 Health Services

Every child has health care under Costa Rican law, which offers care to children under 18, regardless of nationality. This also applies to pregnant women, who can give birth in the hospital without limitation. People with salaried jobs tend to be covered by business-supported insurance, which also covers immediate family members (see Figure 3). Others need to pay a voluntary monthly fee to be covered by health care and social security. Without insurance of any kind, anyone who receives public medical attention will have to pay a bill. The nearest hospital is Enrique Baltodano Briceño, which is identified in Image 2. This hospital attends MB residents except when specialized attention is needed. This rarely happens, but a couple of cases were reported where residents had to travel five hours by bus to San Jose to receive the necessary medical attention.

Martina Bustos residents born in Costa Rica are beneficiaries of the national public health services, as are pregnant women. Unfortunately, all other residents are “health insecure,” as private health facilities or the monthly voluntary payment is beyond their financial reach. Residents have pointed to a health center or clinic as a central need.

4.8 Everyday Activities

Women

The average woman in MB spends most of her time on child care, if she is a mother. After waking up, most women make breakfast, either before or after connecting their water hose to the public fountain (assuming it is her responsibility to get water). She then drops off her children at school and works in the home (washing dishes and clothes, sweeping the floors, etc.). When she is done with the housework, she looks for a way to spend free time. These activities vary depending on the woman's age.

Watching *telenovelas* is a common way for women, young and mature alike, to pass the time. Sometimes, they will watch up to five shows per day. Elderly women tend to pass their time in reflection, or spend it working on handicrafts. Due to the hot weather, people often rest at midday.

Men

Men who leave the community to work are somewhat disconnected from everyday family life because they wake up early and return home late. Over the weekends, they are often tired and do not go out, preferring to stay home and rest. Men who do not have formal employment were reported as "repairing the home" and cleaning.

Children

Children were not interviewed directly, but their mothers reported that they clean their rooms, watch television and play soccer or marbles. Many children were seen watching the Cartoon Network channel attentively with older people or with groups of children. Almost every home in MB pays for Cable TV service.

Women mainly identify as housewives, men as workers and children as students. Lack of childcare (like a kindergarten), water services, and efficient transportation cut down on residents' spare time. These are prime leverage points to increase spare time, thereby making room for other income sources, social activities and political engagements.

4.9 Community Cohesion

Collaboration Among the Community

Around 50 people attended the meeting at the communal hall for the official release of the census report, which seems to indicate an interest in participating in local development processes. It should be noted, however, that community leaders feel there is a general lack of community cohesion.

Community members cooperate and coordinate with each other on various informal fronts. They keep an eye on each other's houses to prevent burglary. Some members of the community share meals. This practice was noted among men who lived alone and who took their meals with families. Also, the surveyor observed that sometimes people, particularly girls, would entertain company at a relative's home. In one specific case, a family used their relative's toilet because they did not have a proper one themselves.

Differences between the Nicaraguan and Costa Rican Population

There is a remarkable cultural difference between the Nicaraguan illegal immigrants and the Costa Rican inhabitants of MB. Because of the political and economic history of Nicaragua, the Nicaraguans have been facing extreme poverty for several generations. This has taught them to survive in precarious conditions. It also affects the way they handle their income in Costa Rica: they tend not to invest in the development of infrastructure,

preferring instead to send money home to Nicaragua, if they still have family there. There is a history of territorial clashes between Costa Rica and Nicaragua, which increases xenophobic sentiment on both sides. Despite these differences on a national level, it is notable that overall, the MB community seems to identify more with their communal experience as MB residents, as opposed to along the lines of nationality.

Martina Bustos is showing signs of greater community organization through collective projects or actions, such as an informal community watch and meal sharing, yet overall community cohesion is low. Central channels of communication, common spaces, and social integration activities are absent in community life. Self-esteem issues and discrimination are some significant barriers to broader integration, both within the MB community and with neighboring communities.

4.10 Leadership in the Community

The most recognized leader in the community is Maira Armas, president of the Development Association, which is the association in charge of many of the main community projects, including attending to the process of land ownership rights. This group seems to have a vertical hierarchy, as members have established roles (deputy, president, treasury and others).

Another group, the Neighbors Committee (NC), is in charge of infrastructure repairs and construction, and like tasks. They provide support through skilled labor: a remarkable asset because they know how to construct in concrete, wood and metal, and already have the tools for the work. The president of NC is Fran García, who says that his organization has a horizontal hierarchy (roles are not titled or well-defined). Many people in the community do not know this group exists, due to the aforementioned lack of communication channels.

Problems among the leadership

Surveys have revealed that there is discord between the Neighbors Committee (NC) and the Development Association (DA), mostly due to confusion and disagreement around a letter the committee had to write in order to join the DA in working on its development plan. This letter would unify them legally in front of DINADECO (Dirección Nacional de Desarrollo de la Comunidad). The process was politically complex and the NC did not agree (or perhaps comprehend) that it was necessary in order to formally develop the alliance. It may also be the case that they were unable to handle the complex paperwork, and wanted support from the DA, which it could not provide.

There is one particular member of the NC that DA members point to as problematic. Anecdotal information suggests that he is attempting to undermine aspects of DA efforts because of the aforementioned issues, particularly by meddling in children's dining hall matters, allegedly spreading misinformation about dining hall food and taking donated clothes for personal use. However, it also appears that there are existing friendships among members of both groups, implying that intergroup communications are possible.

It's important to note that the DA is made up of older or elderly members, and as such, health issues plague the group. Maira's husband has cancer, and she feels sick as well, and is therefore uncertain if she will resume presidential duties for the DA in 2016. The DA reelects its members every two years. Almost all of the members of the association are variously ill, however they appear committed to the DA's work. The DA is hopeful that the next election will bring young people into the organization as older ones retire.

Perception of the leadership by the community

The surveyor found out that many community members feel that the DA "doesn't do anything for MB," and do not involve themselves in DA activities themselves. This points to the communication problems in MB. The Development Association does not advertise their meetings, not even to the NC's leader who lives right beside the plaza where meetings take place. Currently, community members must be proactive to learn about DA activities if they want to participate. Most would prefer prior notification about meetings that they do not receive.

The MB Development Association is the main leadership organization, comprised of residents who have made it their mandate to implement a development plan that deals with common issues in the community. The Neighbors' Committee is another organization focused on solving practical problems that can be solved with labor and the proper materials, and do not require institutional interaction (i.e. construction and maintenance work). The existing problems between these two organizations seem to point to a lack of effective communication, and a lack of skills to deal with formal or institutional structures. No young people are currently involved with the Development Association, which implies a dearth of educated and trained next-generation community leaders. This fact presents a risk to the continuity of the project.

4.11 Relations with Non-Community Members

Relations with neighboring communities

The people of Martina Bustos do not seem to have active interactions with neighboring communities except in relation to work duties. Some unemployed women reported visiting friends and family in nearby communities to talk and pass the time. Relationships are often built around the various schools where MB students attend, as mothers attend meetings with other mothers from around the area.

The limited range of exposure is exemplified by the experience of one local livestock breeder, who only leaves the community to occasionally visit a girlfriend in Nazareth and to collect free and leftover feed for his pigs from Santa Ana and the agricultural fair in Liberia.

NGOs that have an interest in MB often keep headquarters in surrounding communities, which creates another form of exposure to individuals from the outside.

Relations with distant communities

Some community members have relationships with people in distant communities. This tends to happen when families move to Martina Bustos for seasonal job opportunities, such as melon or aloe harvesting, and keep relationships with community members when they leave. Some interviewees mentioned having relations come from afar and visit for a few days at a time.

Relations with family abroad in Nicaragua

In several reported cases, relationships with Nicaraguan family members are either non-existent or restricted to phone calls. In specific cases, Nicaraguan members of MB would travel only in the case of an emergency, like a serious illness in the family. Other Nicaraguans in MB travel back and forth regularly. At least one illegal Nicaraguan immigrant in MB travels back to Nicaragua regularly to receive health care. No one reported that more family members from Nicaragua are coming to MB to stay.

There is a control implemented by frontier guards in which they collect the papers of a Nicaraguan leaving Costa Rica. This is so that if the Nicaraguan decides to return, they will have to pass through the same controls again. This is done to eliminate the common practice whereby Nicaraguan immigrants eschew the legal frontiers, hoping instead to bring new family members into the country illegally.

The Costa Rican government also allows Nicaraguans to meet each other at the border for two hours on Sundays. For Liberian residents, it is not difficult to travel the 100km to the border, though on the Nicaraguan side, distances are often far greater. The travel distance for Nicaraguan residents coupled with the limited meeting time disincentivizes the practice of meeting at the border, nonetheless it still occurs.

Martina Bustos functions as a largely segregated migrant community. Relations with other communities come mostly through the few job opportunities that some residents have secured outside of MB.

4.12 Common Infrastructure and Projects

Common Spaces

The only common area in MB is the main plaza, located in the northwest corner of the C2 sector of MB (Image 3). The community hall there is used as meeting place and as the children's dining hall. The church also offers a covered area where numerous activities can be held; it is located at the southwest corner of sector C10 on the map (Image 3).

Day Care Center (planned)

At noon every weekday, the dining hall serves lunch to around 44 children, who have often been there since 9:00am playing and participating in workshops offered by independent volunteers. These workshops cover different topics, such as English language skills or sanitation (hand-washing or tooth-brushing for example). It is also common for some mothers to help out and eat at the dining hall as well. The cooks are not paid, and are volunteers from the community.

Funds for food come from activities run by the MB Development Association, such as bingo nights. Additionally, NGOs like Tej Kohli or The Unbound Foundation sometimes contribute financial support. Protein, like chicken, meat, or eggs, is bought at local stores. Other provisions (juice, rice, beans and sugar, for example) come from a grocery store in Liberia called Los Cartagos.



MB children are weighed in order to determine patterns of malnutrition; the routinely underweight qualify for lunch at the dining hall. Not all MB residents and participants are aware of this process and some claim that children are only selected based on the preferences and connections of Development Association members.

Martina Bustos Development Plan 2014 - 2016

The Martina Bustos Development Plan for 2014 - 2016 consists of 29 priority actions established by the Development Association. The plan can be viewed in its entirety in Resource G. The listed actions include, for example, improving allocation of garbage cans, painting the only bus stop, obtaining further material for the dining hall, creating a public park, gaining access to certain public services, and more. The implementation of this plan has been budgeted at \$2,708,500,000 millions of Costa Rica Colons or \$5,136,057.885 USD.

In the last year, Martina Bustos has increased the number of community projects due to the efforts of the Development Association. Their main achievement thus far has been the creation of a dining hall, which is running under the coordination of some of the community women. Currently, The Development Association does not have funds for any of the projects outlined in their development plan.

5 Spiritual or Values Domain

This section aims to frame the sentiments community members hold towards their space and to the broader community. It is important to note that these features can be connected to broader social and infrastructure programs to inspire change and integrate existing community culture in plans for the future.

5.1 Appreciation of surroundings

Community members were asked if there is a place in the community that they think of as beautiful. Locals pointed to two main areas: a river located at the south of the community, and some hills near point Y in Image 3. From these hills, one can see the sunset, as well as an excellent panoramic view of the prairie. At night, planes can be seen departing from the airport.



Though the space is beautiful, its relative isolation and proximity to sectors 7, 8, 9 and 10, which are considered problematic and somewhat dangerous by MB's population, disincentivizes residents from going there. There was at least one confirmed case of a bicycle being robbed while its owner was watching the sunset.

It is likely that with better security measures, community members could appreciate their natural areas more, which could encourage further community cohesion and long-term connection to the area of Martina Bustos.

5.2 Narration of Communal History

Record as ethnographic notes from community member accounts

People report that MB was calmer in the past, with no drugs or alcohol problems, nor home burglaries. In the beginning, water was even scarcer and had to be carried from Nazareth at dawn with bicycles and carts. There was no electricity, so residents used candles. Because there were no water pumps, people were forced to go to the river to wash their clothes. Recycling from local dumps was a main source of residents' subsistence lifestyle.

Community members look on those times, fifteen years ago or more, as hard times, especially for vulnerable residents like pregnant women. It is possible that archiving narratives that highlight the community's common history can inspire a greater sense of community and communal action.

5.3 Special Dates in the Year

Community members celebrate the birthdays of family and friends, as well as Father's Day (on the 3rd Sunday of June) and Mother's Day (on the 15th August).

Some residents reported traveling to the beach in December or during school vacation (first two weeks of July). During December, residents commonly have more time to spend with their families, preparing traditional food together as the countdown towards the end of the year begins. In December, the NGOs foreign sponsors tend to visit the community to celebrate with the children.

Another important celebration is Liberia's Fair, which happens for a week in February and again over a week in July. It consists of live concerts, mobile discotheques, cattle/agro exhibitions, a carousel, games, and food and alcohol vendors.

A community is missing a collective sense of values. Some related issues have been identified by the surveyor, such as the common appreciation of sunsets and the landscape, which increase the sense of belonging and sometimes feeds the desire to settle and invest in MB. Common activities that would foster collective identity are for the most part absent. The development of activities related to their common environment, work or school affiliations, etc., can bring forth a deeper community identity.

6 Organizations Involved in Martina Bustos

6.1 Governmental Organizations

- U.C.R. (Universidad de Costa Rica): Given entrepreneurship workshops about various topics, such as how to handle budgets
- T.E.C (Instituto Tecnológico de Costa Rica): Contributed labor and materials for the construction of the dining hall.
- U.N.A. (Universidad Nacional): Worked on constructing the dining hall ceiling.
- I.M.A.S. (Instituto Mixto de Ayuda Social): Sponsors adult students to finish their high school education. They contribute \$120 per month for periods of three or six months. Many people stay in school in order to collect this sponsorship.
- DINADECO (Dirección Nacional de Desarrollo de la Comunidad): As a result of the 2014 GSF session, which reinforced the DA's work and development plan, Martina Bustos now receives 2% of this organization's budget for development project's within its zone, which amounts to about \$2,000 or \$3,000 per year.

The government is generally unsupportive of the MB community, and offers little attention. Institutional interventions seem to be largely palliative, driven by individual or organizational interests rather than the responsible integration of Martina Bustos residents into Costa Rican society.

6.2 Non-Governmental Organizations

Many organizations have come into MB and done surveys in order to generate databases. Oftentimes the information sought in these surveys has already been collected, yet the organizations leave without making the data available, leaving other organizations to repeat the process. This is why many people in the community have lost their trust in outside organizations. Some even resent being asked for information. One potential reason for the built up anger and resentment is that these organizations do not provide appropriate feedback, so the community does not know what the information is being used for.

Some NGOs that have been involved in the community include:

- Proyecto vida: Provides medical doctors for people and animals.

- Techo para mi país: Constructed one hundred wooden homes between 2011 and 2013; they selected people with the poorest home conditions, who had to assume a cost of around \$150 dollars in order for the NGO to construct their new home.
- Tej Kohli Foundation: Gives money to the children's dining hall, which began in November 2014, after five years of gestation in partnership with Manos Abiertas Foundation and EARTH University.
- Fundación Manos Abiertas: Helped organize process and resources related to the children's dining hall, and helped with its maintenance. Provided reading and writing classes for adults in 2011.
- Unbound Foundation: Sponsors many children from the dining hall.
- Various churches: Give faith based classes (values, ethics and religious lessons) to children on Sundays in the communal hall.
- EARTH University: Helps with logistics related to donations to the dining hall. Has also given workshops about hydroponic agriculture to mothers and community leaders.

Martina Bustos has received attention from NGOs in the areas of housing improvement, child nutrition, animal castration, religious activities and hydroponics. The attention is not consistent and does not follow a collective plan. Efforts are useful for the community, and many have dealt in skill acquisition, but collectively, they are not significant enough to produce transformational change in their lives.

6.3 Educational Organizations

- IPEC: Offers free courses and technical training. In MB, crafts, jewelry and bakery courses have been available to both students and adults.
- INA: Offers a variety of free courses like food handling, auto mechanics, and electronics.

These educational organizations have been focused on skill-building. Some residents have been able to apply these skills towards employment. Skill building has proven to be one of the most productive ways that external organizations have contributed to Martina Bustos residents.

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Resources

- A. Field Report Database:
Index - <https://goo.gl/pC7gef>, Database - <https://goo.gl/DECMP7>
- B. Table Detailing Survey Methods - <https://goo.gl/QCmuUC>
- C. Survey Used with Community - <https://goo.gl/GVhKMZ>
- D. Martina Bustos Estate Information from National Register - <https://goo.gl/kpHEKa>
- E. Martina Bustos Land and Infrastructure Survey, in Pictures -
<https://goo.gl/H09WVB>
- F. Census Conducted in 2015 by Equipo De Trabajo Del Frente Amplio -
<https://goo.gl/zdG07o>
- G. The Martina Bustos Development Plan for 2014–2016, as prepared by the MB
Community Development Association - <https://goo.gl/OQv7Nc>
- H. Project Transition: Immediate and Short-Term Actions - <http://bit.ly/1WuBQ0d>