2015 DOW SUSTAINABILITY FELLOWSHIP GRANT PROPOSAL || PHASE II

Executive Summary

Assembled by University of Michigan graduate students, this progress report for the Graham Sustainability Institute's Dow Sustainability Fellows Program analyzes key issues that affect the quality of life for residents living in Santa Marta, an informal settlement in Brazil. It proposes a series of interventions that we will implement in the upcoming year with the support from the Dow Distinguished Award.

Santa Marta is located in São Leopoldo, a city approximately 30 kilometers north of Porto Alegre, Brazil. São Leopoldo has a conglomeration of informal and formal settlements, which include regularized neighborhoods and public housing projects. Santa Marta faces a host of environmental challenges that result from trash dumping in public spaces, trash burning, animals opening trash bags, and inadequate sewage, water systems, and road infrastructure. These issues stem from systemic inequalities within the governmental structure that provides waste management and infrastructure resources, as well as the lack of public participation in the participatory budget process. Our project partners have already combined efforts and begun working with the municipal government of São Leopoldo to address these issues. This progress report details these efforts and provides a recommendations for project implementation based on field research conducted by the University of Michigan team in conjunction with local partners.

In March 2015, the University of Michigan team visited Santa Marta to gather information from interviews, surveys, participatory mapping exercises, and visioning sessions. During the trip, we established relationships with the students and teachers from the Santa Marta K-9 Municipal School, the São Leopoldo Prefeitura (Municipal Government), and the Santa Marta Neighborhood Association. These efforts have shaped the content of our recommendations for intervention and have been invaluable in determining the underlying factors that enable the identified issues to persist. The complete capstone report, with findings and recommendations, is available on Taubman College's website: https://taubmancollege.umich.edu/urbanplanning/students/student-work/master-urban-planning.

This progress report highlights a number of different recommendations and initiatives we hope to implement in the local community. These initiatives will encompass and improve environmental stewardship and communication between the local government and the community at large, activate public spaces, upgrade infrastructure, and create a greater sense of community pride and community ownership. The success of our project depends directly on meeting the needs of our community partners and better understanding the interactions between the municipality and the community.

In addition to identifying route causes to these underlying issues and identifying different interventions, we also have created a *quasi-guidebook* for leaders in Santa Marta to use to address the key issues and problems identified herein in order to promote self-capacity. We carefully compiled the *guidebook* by using Santa Marta's history and natural environment as the initial stepping stones toward creating initiatives that not only address the identified issues in a comprehensive manner, but also instigate recommendations that are holistic and wide-reaching. This progress report begins with an *introduction* that provides background information on Santa Marta to provide context for the targeted issues and problems in the community. The *second part* of the progress report synthesizes the data gathered and analyzes the core issues that we have identified. The *third section* details the recommendations we propose and the visions we see for activated and upgraded public spaces in Santa Marta. The *fourth part* of the progress report highlights the progress and achievements that have been accomplished to date as well as where the Dow seed funding has been dedicated. We will also discuss the implementation plan for our recommendations, timeline, and major milestones such as scaling these recommendations which can then be used in other informal settlements within the Rio Grande do Sul region. Finally, by providing a

detailed proposed budget, we hope to share how we perceive our implementation plan will be accomplished both with full funding as well as with funding at a 50% proposed level.

The community of Santa Marta has a history of strong collective action among residents and the capacity to re-envision and redefine what it means to be a proud resident of Santa Marta. We hope that our proposed interventions will not only be used as a learning and advocacy tool, but we also hope that they can help bring more community cohesion, inspire environmental stewardship across the different generations living in the community, improve strategic neighborhood infrastructure, and serve as an example for other informal settlements.

History and Context

São Leopoldo is an industrial city in the Porto Alegre metropolitan region. The city has 24 districts, which include formal neighborhoods and informal settlements, including unregularized communities, formal neighborhoods, and public housing projects. Santa Marta is located in the Northeast portion of São Leopoldo, the region of the city with the highest relative increase in population (26%) and households (45%). Santa Marta faces both environmental and social challenges resulting from informal and unequal urban development. The most common environmental problems include open sewage, unpaved streets, and flooding in parts of the informal settlement. Flooding is aggravated by an inadequate waste management system, social norms that justify littering, and lack of environmental awareness about the relationship between littering and dumping and clogged drains and flooding.

Santa Marta is one of the poorest informal settlements in São Leopoldo. Originally settled by informal recyclers around a nearby dumpsite, development of Santa Marta occurred through spontaneous land occupations, as well as clandestine and illegal land subdivisions. Despite the fact that most residents do not have land title and only a few lots are regularized, they have fairly strong security of tenure and do not risk eviction. The security of tenure is in part due to the fact that Santa Marta is zoned for low income housing, a zoning designation called AEIS (Special Zones of Social Interest). AEIS integrates the informal areas in the municipal zoning scheme and urban planning laws and regulations (Fernandes, 2002). The Brazilian Constitution (article 183) guarantees the social function of urban land, explicitly stating that, "someone who possesses as their own an urban area up to 250 square meters for five years, uninterrupted and without opposition, using it for housing for them or their family, acquires it as their domain as long as the claimant is not the owner of another urban or rural property..." (Fernandes, 2002). The City Statute of 2001 (Law 10.257) is the enabling legislation for article 183 (and other urban policy articles in the Federal Constitution). Under the City Statute, AEIS is a policy tool aimed at preserving land for low-income housing (City Statute, art. 4°, inc. V, line "f"). AEIS designation maintains an area for a community and its residents and prevents companies and developers from buying the land and integrating it into the formal land market, which largely concentrates the middle- and high-income classes. This City Statute encourages the legalization and improvements of tenure conditions and security in informal settlements.

Informality is often defined as the "lack of serviced land and social housing as well as a dysfunctional legal system which generates large costs for residents including the lack of public services, discrimination by others, environmental and health hazards, and inequitable civil rights" (Fernandes, 2011, p.3). Although Santa Marta is zoned as AEIS, our interviews with municipal planners, architects, and elected officials revealed that the municipality is unable to identify land ownership for most parcels. The municipality does not provide permanent infrastructure on federally owned land or on privately owned land that has been either occupied or under dispute. Thus, Santa Marta residents who occupy these types of land do not receive certain public works and services, such as street pavement.

Community Action

Given the environmental and infrastructural problems in this community, teachers and students at the Santa Marta K-8 School started organizing to build environmental education programs that are meaningful and cognizant of their realities. The community has found respite in building environmental awareness through the implementation of the federally sponsored and student-led association, Com-Vida. Under the leadership of Sandra Grohe, one of the teachers at Santa Marta School, the Com-Vida program began in 2013 with the aim of decreasing violence within the community through processes of mediation and raising awareness about the dangers and consequences of dumping, littering, and living in close proximity to the Arroio da Manteiga creek. São Leopoldo's Department of Education sponsored 32 schools to attend an environmental education training seminar and another twenty schools to attend the Children, Youth, and Environment Conference, both of which the federal government sponsors. These two forums promote environmental education and encourage schools to formally implement environmental education as part of the national curriculum. Thus far, five schools in São Leopoldo have active Com-Vida programs. The Santa Marta School's Com-Vida program, however, is the region's flagship program; many schools in the region are currently attempting to model their program due to its success. Santa Marta's Com-Vida program, which has ten active student members, has successfully raised environmental awareness in the school. However, the students and administration seek recommendations for programs to change individual behavioral patterns with regard to dumping and littering practices, as well as to transform outsiders' negative perceptions of Santa Marta and strengthen community identity and pride. To accomplish these goals they pursue environmental education campaigns as well as concrete physical upgrades to the settlement. The UofM team partnered to identify strategic physical improvements and effective public campaigns.

The support and basic foundation of Com-Vida derives from Bairro Melhor, the Better Neighborhood program. The Better Neighborhood initiative is a program through the Federal Education Department, O Programa National de Educação Sustentavel. This initiative is, "designed as a policy for basic education, which provides for close cooperation between school and community, and between Basic Education and Higher Education. The programs promote that school, university and community create synergistic relationships and strengthen each other in the transition and building of sustainable societies, as envisaged by the Treaty of Environmental Education for Sustainable Societies and Global Responsibility" (Ministério Da Educação, Secretaria De Educação Continuada, Alfabetização, Diversidade E Inclusão Diretoria De Políticas De Educação Em Direitos Humanos E Cidadania Coordenação Geral De Educação Ambiental. Apresentação do Programa Nacional Escolas Sustentáveis).

Although the municipality recognizes Santa Marta, the community lacks the capacity to seek assistance in improving its educational, public services, recreational, and environmental remediation programs. Santa Marta School, the student-led association Com-Vida, and the Neighborhood Association voiced the need for environmental, physical, and educational interventions that address the inadequate waste management and lack of usable public space[1]. Although some residents have been living in Santa Marta for over thirty years, the community as a whole is relatively new. Since it is a new community, residents do not possess a strong sense of belonging to the community; this is also due to being perceived negatively by other neighborhoods and nearby communities. We aim to put forward recommendations that change ingrained behaviors toward waste disposal through different public campaigns, upgraded environmental conditions, the identification of land and property rights through improved communication with municipal leaders, and strengthen residents' sense of belonging and attachment to the community and environment. Furthermore, our interventions aim to identify specific ways in which community leaders can partner with the local government on improving municipal provisioning of public works and services.

---

[1] In August 2014, key stakeholders met and agreed to prioritize public space for leisure and environmental education as the main areas for intervention.

Our project goals and planning interventions take into consideration the need to plan with limited resources, therefore we tailored some of our recommendations and project goals in such a way that community members can pursue change without a lot of resources, funding, or governmental support. We believe it is possible to think on a small scale and still have a large and long-term impact. Santa Marta is rich in community, but has noticeable deficiencies in the dialogue between community members as well as the São Leopoldo municipality. This project also provides more insight on how to leverage collective action in promoting environmental and public space stewardship in making Santa Marta a home that all residents can enjoy. We hope that our proposed interventions in Santa Marta can serve as a paradigm for other informal settlements in building community capacity and engaging in effective dialogue with the municipality which can be scalable in the near future.

In developing our approaches and recommendations for Santa Marta, we considered the social context of the community, the importance of place based interventions, and the underlying need for sensitivity of the environment, the priorities of residents, and the aspirations of the community. We conducted rapid appraisal techniques and community participation activities during our intensive field research trip in March 2015 (full methodology is available in the capstone report on Taubman's College website at https://taubmancollege.umich.edu/urbanplanning/students/student-work/master-urban-planning), which we crafted after understanding the concerns voiced by our project partners. Our recommendations do not present a single solution for each issue, but instead offer a multi-faceted approach to answer the concerns of residents and issues in Santa Marta. While not an exhaustive list, we have identified six goals that our team used when developing our recommendations. -

1) Deterring dumping

The residents voiced concerns about the amount of trash and litter they saw in their neighborhood and the threat illegal dumping posed to their community. These recommendations approach their concern about excessive trash by deterring people from dumping and offering new methods to address waste management.

2) Increasing communication and dialogue between the São Leopoldo Municipality and Santa Marta residents

Information is frequently lost between the residents of Santa Marta and the municipality. These recommendations encourage a clearer dialogue between the two parties to help public officials recognize the community's needs and residents better understand what the municipality can offer in return. They aim to not only build self-agency within the community, but also foster co-management, bringing the municipality and Santa Marta residents together in mutually beneficial ways.

3) Building community pride and visibility

Santa Marta's image has suffered under the weight of threats such as illegal dumping, crime, and general disinvestment. These recommendations bolster pride in Santa Marta and establish a stronger sense of place. They aim to change the community's reputation and shift residents' sense of identity and self-worth.

4) Improving security

Unsafe streets, vandalism, and crime threaten Santa Marta's requests for more public spaces to gather and connect. These recommendations hope to offer new welcoming spaces and address the threat of crime in implicit, yet powerful ways.

5) Controlling flooding

Equipped with a mix of informal and formal water infrastructure and located in an area prone to heavy rainfall, Santa Marta is especially susceptible to flooding and the risks heavy rain can bring. These recommendations propose methods to control stormwater and proactively avoid flooding in innovative ways.

6) Developing strategies for requesting service upgrades and regularization of Santa Marta's streets, sewage, and infrastructure

Upgrading and regularizing Santa Marta's streets, sewage, and infrastructure is a gradual process. As the community grows, we offer these recommendations to help streamline municipal intervention and help the residents of Santa Marta develop strategies to request service upgrades.

Proposed Recommendations

Two examples of our recommendations that touch upon the six goals listed above include 1) piloting an interactive community mapping program and 2) initiating public campaigns directed towards improving community waste management behavior.

The municipality of São Leopoldo distributes services differently depending how it formally recognizes the land. Informal settlements are either located on public or private lands, as is the case in São Leopoldo, and oftentimes landownership is ambiguous or unknown. The municipality's records reflecting the current ownership of the parcels in Santa Marta remain unclear and may only cover a portion of the entire settlement. Because of this unclear land ownership, Santa Marta's requests for infrastructure upgrading may remain unmet by the municipality. Different actors within the municipal government voiced their concerns about the legality of upgrading infrastructure on land with unclear ownership. The municipality understands they cannot make improvements on federally owned land, yet it is unclear as to what land is federally owned in Santa Marta. Since the municipality does not know who owns the land, it cannot develop or implement the necessary infrastructure to provide formal services. For example, in São Leopoldo the Department of Public Works decides which roads to pave based on land tenure and prioritizes projects dependent on the oldest roads and the roads where the most traffic flows. Due to the ambiguity and mixed property rights in Santa Marta, the department is cautious to pave roads on occupied areas that may be federally owned, fearing potential lawsuits from federal agencies and private actors who may have claims to the property. As a result, Public Works only levels and gravels roads in newly constructed areas that could be on federal or private land despite it being more expensive and time consuming to continuously level the roads with gravel rather than paving them after inclimate weather.

Searching for lawful alternatives in order to provide basic public works and services, regardless of land tenure and ownership status, the UofM team discovered that the municipality has the right to pave streets on private land where squatters have built homes São Leopoldo does not need to fear indirect expropriation lawsuits from private actors and other municipal legal departments in Rio Grande do Sul, if they provide basic services in informal settlements on privately owned land. However, these rulings do not apply for federal land.

As Santa Marta grows and informal settlement stretches beyond the limits of city maps, municipal departments are pressured to update their records that also visibly demonstrate their planning priorities. With that being said, one of our solutions to this problem is to create a skilled mapping team to map the informal settlement and determine which lands are federally, municipally, or privately owned. This community mapping initiative will help residents direct and facilitate their own community upgrading process; this can be accomplished by teaching community members how to map their surroundings

thereby enabling them to share information on their community's needs and to better articulate strategic ways for the municipality to intervene. The Santa Marta School students already have experience using Google Maps, and therefore this mapping initiative will not be foreign to them. We, would like to, however, expand on their prior knowledge and teach more technical skills for the future.

The underlying goals of the interactive community mapping program focuses on the participatory mapping process that can build community agency and facilitate a clearer dialogue between municipal leaders, service providers, and community residents. This community mapping pilot program can provide further access to:

1) *Infrastructure*: street conditions and streets prioritized for upgrading and paving
2) *Public Places*: inventory and condition of open spaces that may serve as possible public places.
3) *Water Infrastructure*: areas prone to excessive flooding or water retention
4) *Waste Management*: sites of excessive trash dumping
5) *'Dark Spots'*: areas with insufficient lighting and inadequate monitoring related to domestic violence and drug trafficking which are prevalent in the area
6) *Self-enumeration*: creating a comprehensive survey of all residents, their houses, and their parcels
7) *History of Santa Marta*: creating a survey that maps the length of tenure and how residents obtaining their property or parcels of land.

Our team would like to pilot our community mapping program which requires teaching mapping and other technical skills within the next year. The community mapping pilot program will provide local residents with the opportunity to produce important information about the community needs, such as determining suitable locations for new stormwater parks and trash traps and identifying which roads needs infrastructural improvements. For example, residents will be able to identify which roads the Santa Marta Municipality has jurisdiction over and can therefore improve versus which ones the Municipality cannot upgrade because they are federally owned. Providing the educational opportunity for a range of Santa Marta residents to work with new technology will empower them to participate in building a stronger and a more resilient community, while addressing waste management issues. We will use Dow funding to buy software for the mapping program and hire a mapping expert to help design the program's process.

The program will be administered from the Santa Marta School; UofM will be partnering with Pontifical Catholic University of Rio Grande do Sul (PUCR-S), under the coordination of, Dr. Isabel Carvalho, Professor of Environmental Education, to start a certificate program in which students and adults will receive the necessary software and mapping training to ably teach the necessary skills at schools in other informal settlements with Com Vida programs.

The second recommendation is to use public campaigns as a tool for sharing information, changing perceptions, bringing people together, and influencing behaviors, processes, and outcomes. The "Together We Make Santa Marta Home" campaign aims to shift social norms and perceptions about trash disposal. Excessive and illegal dumping has posed a number of issues to the waste management and stormwater drainage system in the community. Fieldwork revealed that some Santa Marta residents view the creek running through the community as a ditch or hole for dumping trash rather than as an environmentally fragile resource. They do not clearly see how littering causes clogged drains, which in turn worsens flooding of their homes and streets. Moreover, our household waste management survey revealed that 16.7% of residents are not bothered by seeing trash in their neighborhood. Moreover, the materials that the municipality currently uses does not effectively engage the entire population, focusing only on reaching children in a school setting (see full report for data collection details, available at https://taubmancollege.umich.edu/urbanplanning/students/student-work/master-urban-planning.

Our campaign aims to engage the entire community in reducing dumping and burning in public spaces, increasing access to information about waste management, and fostering an understanding of the importance of improving the storm drainage system and the reporting of clogged or broken drains. Equipped with a mix of informal and formal water infrastructure and located in an area prone to heavy rainfall, Santa Marta is especially susceptive to flooding and the risks heavy rain can bring. We have proposed methods to control stormwater and proactively avoid flooding. Materials addressing a number of these campaign topics will use messages that instigate behavioral change by 1) drawing a connection between home as one's home and home as one's community and 2) explaining the negative impacts of dumping and burning trash. These messages will be conveyed through signage, posters, public art, maps, and slogans that will be posted in environmentally sensitive areas, public spaces, and public transportation stops that have been already identified during our March 2015 visit.

A successful example of using public campaigns to change behavioral outcomes is in Bogotá, Columbia. The City of Bogotá suffered from poorly defined public space and littering, as well as unequal access to parks and misuse of open space. Moreover, rapid urban growth paired with a lack of planning exacerbated these issues. The city used passive and active communication to promote better uses of public space. Passive approaches involved using provocative signage in parks that say things like "This is your park too. Keep it clean" Active approaches involved the city employing or appointing active monitoring agents to discourage littering and misuses of public spaces. Agents included civic guides, city workers, security guards, and police (Berney, 2011, 22-23).

The "Together We Make Santa Marta Home" campaign aims to shift social norms about trash disposal and help residents understand the connections between littering, water pollution, and flooding in Santa Marta. We will use Dow resources to produce the materials for this campaign. With direct messages, appealing graphic design, and the help from local Com Vida students, the education campaign will reach not only the local school children but also Santa Marta residents at large. Signage displayed throughout the community will help residents feel more accountable for their actions in creating and maintaining a cleaner and safer community.

In addition to visioning an interactive community mapping program and proposing a new public campaign for the community, our team has developed other recommendations to activate safe public spaces within the community. Creating a successful public space goes beyond transforming the physical space; it is about enabling new modes of social interaction and public activity through programming and place-based design. For example, the Kounkuey Design Initiative was faced with the same question in their efforts to establish productive public spaces in Kibera, Kenya. Concerned with open spaces that became informal dumping grounds which divided the neighborhood and undermined community mobilization, Kounkuey Design Initiative brought together a team of designers, planners, engineers, and community members to create public spaces that gave a new use and identity to these previously overlooked and mistreated spaces. Our goal is also to transform environmental liabilities into usable public spaces. This can be accomplished through design, such as creating simple and economical litter traps and stormwater parks that can be used as benches and serve to beautify the community.

We have discussed continuing our partnership with local universities in the area to further develop the initiatives and programs while Michigan students provide technical assistance remotely. Many of our recommendations rely on the assistance and implementation by Com-Vida, local universities, and other identified partners; these efforts are possible due to building strong relationships with our partners and a growing interest for involvement and cooperation within the São Leopoldo region. Our leadership during the pilot stage of the program will empower community members to take ownership in regards to the recommendations that we are helping them implement.

Progress Report

Since conducting preliminary research in January and February and completing field research in Santa Marta in March, our team has created a *guidebook* that outlines the history and context of Santa Marta, synthesizes data gathered from surveys, interviews with municipal leaders and Santa Marta residents, and community participatory events that target core issues that we identified during our preliminary transect walk through the informal settlement, as well as provides recommendations that Santa Marta residents can implement into their community. While many of these interventions can eventually be implemented at a low cost, funding is sought after to pilot these initiative and programs. In April 2015, our team received the Dow Sustainability Fellows $5,000 seed funding. We used a portion of the funds to translate our 200+ page *guidebook* into Portuguese that we sent to both the São Leopoldo Prefeitura as well as community leaders in Santa Marta. The other portion of the seed money was allocated to facilitating a reciprocal relationship with three Santa Marta residents who are actively involved in Com-Vida and bettering the community as a whole. In order to further facilitate the relationship and trust required to work with community members, we used the rest of the seed funding for the travel and accommodations of the principal of Santa Marta K-8 School, teacher and liaison of Com-Vida, and student founder of Com-Vida, to Ann Arbor, Michigan. Not only was our team able to present our findings and plans for intervention to our client partners as well as receive immediate feedback, we were also able to demonstrate the sustainability practices that are being used right on University of Michigan's campus. Our project was well-received and our client partners are excited piloting the suggested recommendations.

Feasibility for Scale and Further Funding

To feasibly pilot our recommendations and scale our programs to other informal settlements in the Rio Grande do Sul region, we are requesting further support from the Graham Sustainability Institute. The objective of this project is not only to provide tangible improvements to Santa Marta but also to create public campaigns that Santa Marta can use to increase environmental and waste management awareness.

Furthermore, with the amount of publicity that the University of Michigan has given Santa Marta, the community is empowered to develop strategies as a community to strengthen dialogue with the São Leopoldo municipality. The recommendations we are currently assessing are being considered in order to develop a sustainable and flexible framework that can be applicable to working with other informal settlements in Brazil.

As explained before, current waste collection system causes confusion for some residents and exhibits certain inefficiencies due to other infrastructural issues in the community. Garbage trucks pick up trash on most streets, but cannot access sections that lack pavement. Furthermore, stray dogs and horses contribute significantly to the dispersal of trash when they tear into the trash bags in search of food. Additionally, many residents rely on open sewage, which runs throughout the unpaved streets. Flooding during rainstorms exacerbate the issues, further spreading trash and sewage through the streets and open spaces in Santa Marta.

As the trash and sewage issues create health and environmental problems, we are seeking interventions that address awareness, access, and upgrades. Alongside the launching of the different public campaigns, with additional funding we propose implementing more tangible outcomes as well. We propose installing larger dumpsters which will facilitate more efficient garbage collection and make proper disposal more accessible. Moreover, trash and debris on the streets cause problems in waterways such as clogging stormwater drains and polluting the water. The entanglement of trash and debris in drains results in a "damming effect" that prevents water flow and produces high cleanup and maintenance costs for municipalities. Storm drains, known as *bocas de lobos*, do not have grates to catch trash and debris before it flows into the drainage system. By retrofitting the storm drains to fit these grates will help diffuse long-

term municipality costs as cleaning up clogged storm drains is costly. We also suggest trash traps as a cost-effective means of remediating nearby creeks while also capturing litter and debris. These trash traps come in the following forms: Bandalong litter traps, StormX, and boom system. Dow resources will be used to install trash traps, dumpsters, and stormwater parks in the locations previously identified by Santa Marta school youth and adult students via the community mapping program. The retrofitting of storm drains to install curb inlets trash taps alone will considerably reduce flooding in Santa Marta Furthermore, implementing stormwater parks can be used to both manage water and furnish public spaces. These stormwater installations will be primarily used to trap the trash washed into drains, but if strategically designed, they can also be used as street furniture to create spaces for residents to congregate. Stormwater parks and new dumpsters will reduce the amount of household trash bags discarded on the streets and into the creek.

By piloting some of our proposed public campaigns, installing dumpsters and trash traps, and launching our community mapping program, meanwhile working to increase community cohesion and community ownership, we believe that residents will organize more frequently and have a stronger voice through collective action to request and maintain public service improvements from the municipality. With the Department of Education proposing that environmental education is permanently incorporated into the primary and secondary school curriculum, our community mapping program and public campaign initiatives will play a large role in helping facilitate these educational programs and educating the community at large. Furthermore, with the support from the Department of Education and the help and outreach of the state-wide Com-Vida programs, these initiatives are scalable first to the 32 communities that already have Com-Vida programs and eventually to communities where Com-Vida programs do not currently exist.

Proposed Budget

ITEM	COST
Mapping Technical Assistance/Software	**$ 12,000**
Waste Management Prototypes, Stormwater Parks, and Trash Traps	**$ 17,000**
Educational Programming Supplies	**$ 3,000**
Graphic Design	**$ 5,000**
UofM Team Member Airfare for Pilot Programming	**$ 6,000**
Accommodations/Transportation (4 weeks)	**$ 3,000**
Follow-Up Reporting Translation Services	**$ 3,000**
Food and Programming	**$1,000**
TOTAL	**$ 50,000**

Timeline

January-February 2015: Literature Reviews and Case Study Research

March 2015: University of Michigan Intensive Field Research Trip

April 2015: Present Recommendations to (3) Delegates from the Santa Marta Community in Ann Arbor, MI

June 2015: Guidebook created by University of Michigan students addressing complex issues and challenges and recommendations for Santa Marta community leaders to begin implementing

September 2015: Contingent on receiving $50,000 award, implement waste management recommendations and devising environmental education initiatives that can be implemented in the school curriculum and for community members.

December 2015: Our team will return to Santa Marta and implement the structural infrastructure necessary to address trash dumping and inefficient waste management collection.

Feasibility of Project Rollout with 50% of Proposed Budget

With reduced funding from the Graham Institute, our interventions can still be feasibly implemented, however, on much a smaller scale. This might reduce the effectiveness if a full-fledged public campaign cannot be launched or software purchased to pilot the community mapping program. We will require a few team members and one faculty member to be at the field site to pilot the programs. Once this is achieved, community members will be leaders in overseeing the future of the programs with their added learned skills. If our team is to receive 50% of the proposed budget, potential partnerships and collaborations have been formed with Pontifical Catholic University of Rio Grande do Sul (PUCR-S) located in Porto Alegre and the Universidade de Vale do Rio dos Sinos (Unisinos) who are interested in developing course projects for improving informal settlements, and other neighboring communities are interested in similar collaborative efforts with universities. This holds the promise of potential funding opportunities and other forms of project support.

We are very excited about the potential of our project and hope to be considered for further funding.

U-M FACULTY MENTORS
- Assistant Professor **Ana Paula Pimentel-Walker**, University of Michigan, Taubman College of Architecture and Urban Planning (TCAUP), PhD, MUP, JD (appiment@umich.edu)
- Associate Professor **Michaela Zint**, University of Michigan, School of Natural Resources and Environment, School of Education, PhD (zintmich@umich.edu)
- Doctoral Candidate, University of Michigan, TCAUP, **Joshua Shake** (jdshake@umich.edu) (Conditional Advisor)

UM-STUDENT TEAM MEMBERS
- **Aayat Ali**, Masters Student, TCAUP & School of Social Work, aayata@umich.edu
- **Stephanie Gerretsen**, Masters Student, TCAUP & School of Kinesiology, sgerrets@umich.edu
- **Alexis Gomez**, Masters Students, TCAUP & School of Natural Resources aggomez@umich.edu

COMMITTED PARTNER ORGANIZATIONS/ADVISORY GROUP
- **Marcia Kehl & Sandr Grohe**, Santa Marta K-8 Municipal School Director, Arroio da Manteiga, São Leopoldo, Porto Alegre, Brazil
- **Municipal Department of Education,** , São Leopoldo, Porto Alegre, Brazil
- **Dr. Isabel Carvalho**, Professor of Environmental Education, PUCR-S
- **Mabel Kessler**, TCAUP
- **Alexandra Markiewicz**, TCAUP
- **Kelly Richardson**, TCAUP