2012 Cape Town Project Centre, Worcester Polytechnic Institute

Executive Summary

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Sponsor: The Stellenbosch Municipality's Department of Integrated Human Settlements (DIHS)

Supporting Reblocking and Community Development in Mtshini Wam

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The Worcester Polytechnic Institute (WPI) Cape Town Project Centre was established in 2007 to engage students, faculty and local partners in "shared action learning" projects supportive of sustainable community development in and around Cape Town, South Africa. This report is an executive summary of six projects conducted in 2012 by 25 undergraduate students from WPI, a university located in Massachusetts, USA , in close cooperation with local project sponsors and two WPI faculty advisors. The work was completed through two months of preparation on campus, followed by field work from 22nd October to 14th December 2012.

The Cape Town Project Centre works most often with historically disadvantaged communities, including both formal and informal settlements. We work closely with local project sponsors and community members on issues they identify as priorities, involving such goals as improving access to water, sanitation, and electricity; supporting entrepreneurship, job readiness, and community-based organizations; promoting urban agriculture and other "sustainable livelihood" strategies; protecting homes from floods and fires; and improving the welfare of children. All projects involve working with local people to learn from them about the project topic and to strategize together how to make progress, both while WPI is on site and thereafter. All projects involve planning and recommendations, and we try to implement at least a small part of each program or construction project so that everyone involved can share the excitement of "learning by doing." In this way we also hold ourselves to a discipline of putting some of our collective ideas to the (often humbling) test of reality.

WPI is enormously grateful to our project sponsors and the various communities that have welcomed us to work in partnership with them. We have learned a tremendous amount about life in South Africa, about people and challenges and hopes and dreams and resolve, and about ourselves. We hope our partners have also benefitted, and that the learning and creating we shared might also be helpful to others taking on similar challenges.

For further information, please see our website at: wp.wpi.edu/capetown

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Laying the Foundation for a Resilient Partnership: Innovative Upgrading in the Informal Settlement of Langrug

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

Abstract

The upgrading of informal settlements in South Africa is a vital yet challenging process requiring persistent multi-stakeholder involvement. The goal of this project was to strengthen the partnership between the informal community of Langrug, the Municipality of Stellenbosch, and our NGO, the Community Organisation Resource Centre (CORC), through innovative, community-driven upgrading projects. Through intensive collaboration, we assisted with initial reblocking efforts, finalised designs and plans for the implementation of a community centre, improved upon current greywater management processes, and designed and began construction of an innovative, communal Water, Sanitation, and Hygiene (WaSH) facility. These projects strengthened community capacity and exemplified the benefits that meaningful partnerships can bring to South Africa's poorest communities.

This project summary is part of an ongoing research programme by students and faculty of the WPI Cape Town Project Centre to explore and develop with local partners options for sustainable community development in South Africa.

For our full project report: http://wp.wpi.edu/capetown/homepage/projects/p2012/langrug/
For more about the Cape Town Project Centre: http://wp.wpi.edu/capetown/

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Introduction

Our Langrug Project Team had the opportunity to work alongside a unique and capable informal settlement partnership in Franschhoek, South Africa as they sought to implement community-driven upgrading initiatives. We were met with many unanticipated challenges: social tensions, cultural differences, and varying degrees of commitment that threatened to overcome the ambition of all of the stakeholders. However, through building relationships, improving communication, and persevering together, we collectively overcame these obstacles

Figure 1: A view down Langrug's main road

and built Phase I of an innovative water and sanitation facility in only a few short weeks.

Setting the Stage

The apartheid regime (1948-1994) in South Africa largely restricted black South Africans to living in impoverished townships that offered little opportunity for socio-cultural or economic advancement. Many blacks moved to the Cape Town area in search of work, and the apartheid regime responded to this population influx by forcing them to reside in shanty towns outside the city. Following apartheid's dismantlement, black

South Africans continued to settle around Cape Town on private or government-owned land. These informal settlements (or "squatter camps") are made up of shacks and rudimentary water and sanitation facilities (Hunter 2012). The haphazard nature of settlements complicates efforts aimed at addressing the built environment as well as "poverty, crime and inadequate provision of health, education and social welfare" (Jiusto & Hersh 2009). Despite these challenges, informal settlements often have a unique and promising vitality. The perseverance, hope, and vibrancy of community members not only inspire but also carry these upgrading projects to their completion.

Informal Settlement Upgrading

Local municipalities, funded under the federal government's housing policy, have attempted to meet the needs of informal settlement communities for housing and basic infrastructural and social services, but they have struggled to find the strategies and financial resources needed to support truly effective, sustainable community development (Bradlow 2011). Many past initiatives have proven unsuccessful in the long run due to the lack of community and NGO involvement. This is especially apparent among water and sanitation facilities implemented in informal settlements. When the community is not involved, the sustainabil-

ity is jeopardised which adds to the ongoing public health and social crisis instead of helping the situation (Manikutty 1998). This lack of community involvement contributes to disempowerment of communities who tend to rely on the government rather than fending for themselves. A new strategy is currently underway in Langrug, a small informal settlement in the Municipality of Stellenbosch.

Table 1: Project partners
The Langrug Working Team
Community Organisation Resource Centre (CORC)
Informal Settlement Network (ISN)
Shack Dwellers International (SDI)
Municipality of Stellenbosch (MoS)
Worcester Polytechnic Institute (WPI)

A Unique Partnership

In 2011, an unprecedented Memorandum of Understanding was signed between the Municipality, the NGO's SDI/CORC, and the Langrug community. CORC is a subdivision of SDI that specialises in working with informal settlements to support community-driven upgrading processes. This was the first instance in the country where a community-based, model partnership was formally agreed upon (Vandenberg 2011). This partnership received national attention at the 2012 South African Planning Institute Conference where the partnership won an award in the Community Outreach category

(Mxobo 2012). This praise was largely due to the establishment of the Langrug Working Team, where various community leaders are actively involved in Langrug's upgrading alongside the Municipality and CORC. Starting in 2011, WPI has had the opportunity to work with this unique partnership. While the partnership model for community leadership has many benefits, there also exists complex sociocultural dynamics that present both opportunities and challenges.

Challenges within the Partnership

According to various newspaper articles and reports from last year's WPI Langrug teams, Langrug was moving forward and making great strides in community-driven upgrading alongside a strong partnership (Vandenberg 2011; Kenney, et al. 2011). Because of this, we anticipated working with a motivated, proactive community with the support of the Municipality and CORC. Upon arriving in Langrug, however, we found ourselves in the midst of a tense social dynamic in a partnership that had inadvertently lost momentum.

The Working Team leaders vehemently expressed their discontent with the current status of the partnership, and the Municipality was in turn frustrated with inconsistent communication and the community's constant demands. Each partner had different impressions regarding the neces-

Figure 2: A partnership meeting in Langrug

sary steps to move projects forward as well as varying expectations for WPI's seven week projects, and certain key leaders were on leave, hampering partnership capacity and decision-making. Most fundamentally, CORC and the Municipality are both extremely capable yet also stretched very thin, with few people and resources available to bring their critical contributions to the many communities in which they work.

WPI's Opportunity

It appeared to us that all of the pieces for a strong partnership were present, but something was preventing those pieces from coming together. Underlying communication issues hindered project progress and community satisfaction. In realising that the partners were struggling to maintain momentum, we saw an opportunity to help fortify the partnership through proactive planning and participation in various upgrading projects. All agreed working hand-in-hand could serve as a spark to reignite community-driven upgrading in Langrug, while we also learned from our local col-

leagues. We managed to produce significant planning documents for several projects, and our work culminated in the physical construction of an innovative water, sanitation and hygiene (WaSH) facility and the realisation of the potential of the partnership.

Key Outcomes

Below is a list of achievements resulting from the various projects that we collaboratively developed:

• **WaSH Facility:** Designed /completed Phase I construction, left plans for future phases

• **Multi-Purpose Centre:** Prepared proposal including design and cost estimate

• **Greywater Health and Maintenance:** Provided equipment and maintenance strategy

• **Reblocking:** Began guidebook and revised F-section layout

• **Communication:** Improved communication and working dynamics between all partners

• **Reporting:** Developed Working Team reporting and documentation skills

• **Website:** Created a website with an extensive narrative describing and reflecting on our IQP experience

Shared Action Learning

A unique approach, known as Shared Action Learning, was used throughout our entire project to help us connect and collaborate

as a group as well as plan and accomplish achievable goals. This approach was drawn from an action research methodology created specifically for the Cape Town Project Centre. It focuses on the sharing of ideas, knowledge, resources, and inspiration among all project partners rather than the idea of us as outsiders "educating" the community (Jiusto, Hersh & Taylor 2011). Using Shared Action Learning helped us to build a respectful and cooperative learning environment while allowing the formation of sustainable relationships. Through continuous cycles of observation, planning, acting ,and reflecting, we collaboratively dealt with many of the dynamics discussed throughout this summary.

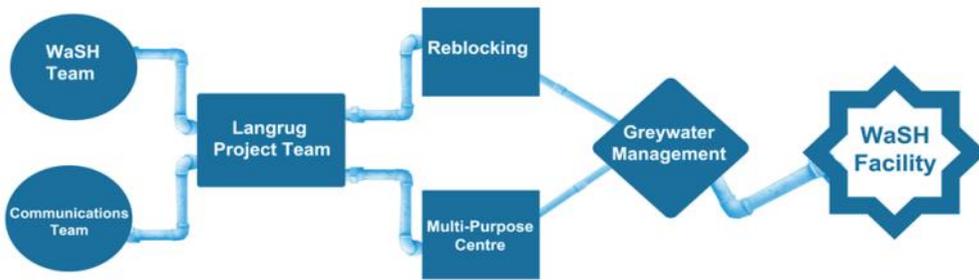*Figure 3: Juan and Kholeka discussing plans*

Figure 4: Evolution of the Langrug team

Evolution of the Langrug Team

The 2012 Langrug project was the result of a merger between two discrete teams, WaSH and Communications, which were formed during the preparatory term. The Communications team planned to aid in strengthening the Langrug partnership and the internal Working Team relationships through Shared Action Learning and team-building activities. The WaSH team planned to design either a multi-purpose WaSH centre or a small WaSH station in a reblocked area of Langrug, building off of the work of previous Cape Town Project Centre teams, most notably the 2011 WaSHUp project. Both teams also emphasised the importance of community involvement and multi-stakeholder cooperation in informal settlement upgrading.

Upon arrival in Langrug, however, it became apparent that our time would be best spent working as one unified group. The first meeting we had with the partnership demonstrated Langrug's urgent need for some sort of physical implementation and improved communication. The partnership had reached an impasse and was struggling to move forward. It appeared as if nothing could be implemented unless the partnership was fortified, while the partnership could not be strengthened without something physical being implemented. These two issues were not dichotomous, as was previously thought, but were intertwined and dependent on one another. Observing these complicated realities solidified the need to refocus and reorganise into one motivated team, combining the knowledge of both teams with that of the Working Team members.

Primary Project Focuses

To move forward, we planned a number of projects that were deemed a priority by the community.

Reblocking

Informal settlements often grow in a disorganised manner. New settlers must locate and erect their shacks as fast as possible in whatever open space is available in order to avoid eviction. This haphazard process often ignores accessibility to services and safety considerations (Gasparre 2011). Many solutions to this problem have been attempted, but recent work by CORC and their partners in South Africa has shown promise in the

Figure 5: Working on plans for reblocking

development of an upgrading model known as reblocking. These communities are found to be more dignified and safe living environments where groups of shacks are clustered together into blocks sharing a common entrance and a courtyard-like area. Each home faces the courtyard where a single entrance ensures that no unwanted individual can intrude on the block. Additionally, reblocking projects rebuild improvised shacks with sturdier materials that can withstand fires and stormy weather. All of these improve-

ments generally come with a necessary financial contribution from the community.

Planning with the Langrug Working Team

After exploring the proposed reblocking project in Langrug, we discovered significant technical and financial issues with the community-developed planning process and documents. The plans for the reblocked cluster showed inaccurate scaling and measurements and did not include a cost breakdown. We decided to obtain new measurements and double-check the information on F-section residents with the Working Team.

Figure 6: Reblocked F-Section Cluster 1

To assist the community, we broke down the reblocking process into three aspects shown in Figure 7.

Technical

- Remeasured current shacks
- Mapped Cluster 1 Area
- Designed reblocked shacks
- Planned cluster layout

Organisational

- Collected resident data
- Drafted proposal for project
- Generated a fire safety report
- Developed cost analysis

Standardising

- Developed "Reblocking: A Partnership Guide"
- Collaborated with Mtshini Wam WPI team to learn about implementation

Figure 7: Reblocking project focus

After explaining the importance of accurate data collection to the Working Team, they were able to better understand the Municipality's concerns regarding the readiness of the community to reblock and were able to move forward with the planning process. As this work progressed, a guidebook was developed to introduce a systematic approach to the previously undocumented reblocking process.

Multi-Purpose Centre

During our initial meetings, the Working Team expressed high priority in the implementation of a multi-purpose centre (MPC). An MPC is a facility designed to provide the community with space for a variety of activities and services. The proposed facility in Langrug would include features that would benefit the entire community.

Importance of Implementation

The implementation of an MPC by the Municipality was anticipated by the Langrug community for the past two years. The Working Team reported being under immense pressure to begin construction as soon as possible due to the community's deteriorating confidence in the partnership. Therefore, we felt that building an MPC would help to restore trust by demonstrating the capabilities of cooperation within the partnership. Realising this potential, we collectively agreed that the MPC would be our major focus with the hope of constructing the facility during our time in Langrug.

Assessment of Needs

A major issue that has led to the failure of past initiatives within informal settlements stems from placing the goals of the provider before the wants of the community (Schouten 2010). Fully aware of this, we began by discussing Langrug's needs with the Working Team in order to plan how this facility could best address these issues. The Working Team had already collected data on problems within the community, most of which fell into four main categories held as a priority by the Municipality: health, edu-

Figure 8: MPC layout with WaSH area

cation, safety, and socioeconomic development. A proposal was then drafted to present to the Municipality which satisfied their four major concerns.

Elements of the MPC

- Mobile clinic
- Space for HIV/AIDS support group
- Soup kitchen
- Reading room/library
- Crèche
- Adult education classrooms
- Office for community leaders
- Spaces for small shops
- WaSH facility

This proposal not only outlined the need for the MPC to all of the partners but also helped the Working Team realise the importance of documentation. Keeping stakeholders continuously informed regarding new developments or considerations about a project is a vital aspect among multiple-stakeholder partnerships (Gerrits 2004). Helping the Working Team develop these skills was an important goal of our project as it fostered better communication within the partnership. Therefore, we hope that they will continue to utilise these skills as Langrug's upgrading progresses.

MPC Technical Designs

Following this conceptual assessment, we shifted our attention to the design of the

Figure 9: Working on designs for the MPC

Community Approval

Community involvement during informal settlement upgrading projects has proven to be an effective way of building sustainable projects (Manikutty 1997). Although the Working Team had collaborated significantly with the community in planning the MPC over the past two years, we felt that it was important to show the current iteration of the design. The Working Team held a community general meeting where they explained the designs and walked around the community gathering signatures to represent residents' approval of the project.

Challenges of the Funding Agreement

With the design process and approval stages nearly complete, we began to discuss the cost share agreement for the funding of the MPC in terms of immediate construction and long-term management options. CORC was willing to share a large percentage of the cost but required a community contribution in order to draw funds from CUFF (Community Upgrading Finance Facility). WPI was willing to cover the remaining construction expenses, while the Municipality agreed to fund the long-term maintenance and management of the facility.

The Working Team, however, foresaw a significant challenge in the collection of the required community contribution due to the community's previous understanding that the Municipality would fund the entire project. Without their contribution, CORC would be unable to fund their share, which meant that WPI would also be unwilling to

facility. While CORC and the Working Team had an existing design based on community input, we collectively agreed that a simplified version would expedite the implementation process. Although this simplified version was smaller than previous models, the MPC would provide sufficient space for all the key elements which had been outlined. The structure would resemble a pole barn with a sturdy, walkable roof to increase communal space. Safety was a major concern so we worked with a building inspector to ensure the Municipality's approval. A SolidWorks design was drafted to assist with the creation of a cost analysis and building timeline. One challenge we encountered was the cultural differences in work habits and construction techniques. Therefore, an important part in creating the building timeline involved discussing the plans with members of the Langrug Working Team, CORC, and the Municipality to gain insight into the local construction techniques.

contribute without full commitment of the partnership. As a result, the project stalled, although the project is expected to move forward early in 2013, using the designs and plans we collectively prepared.
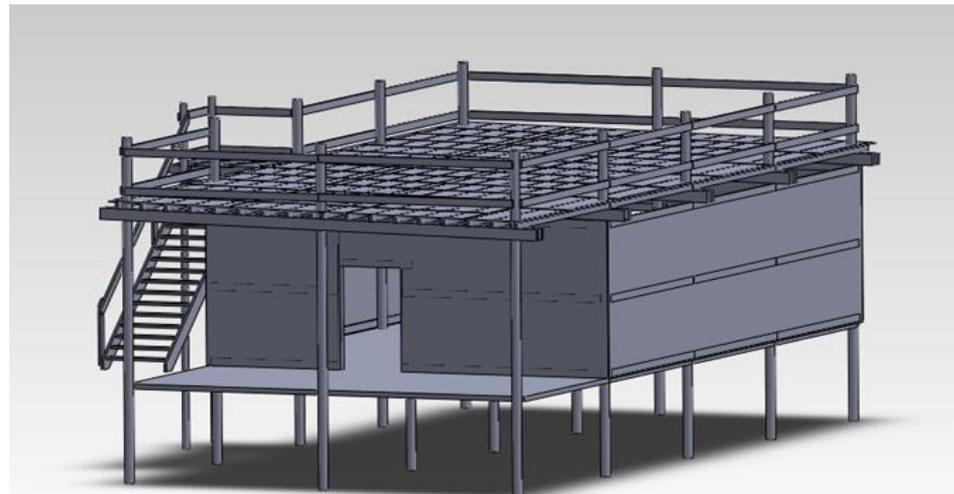

Figure 11: Steps necessary for the implementation of the MPC. Last two steps remain to be completed

Greywater Health and Maintenance

While waiting for the MPC to move into the implementation phase, we engaged the Working Team in a discussion about the greywater channels. Governmental funding provides the Working Team with a stipend for this task, but the Municipality had recently expressed frustration over the inconsistent cleaning. We discovered that the team had not been fulfilling this daily duty

Figure 10: MPC design

because of health concerns, including rashes and the risk of bacterial infections, resulting from their lack of protective gear. We approached the Municipality with this issue and discovered that though the Working Team felt they had expressed their concerns, the Municipality was unaware of the problem.

Boots, gloves, and facemasks were subsequently purchased for each team member. This simple remedy highlighted how the partnership could be improved if communication and reporting were more frequent and direct. We also worked with the team to develop a cleaning schedule, tool maintenance procedure, and a personal hygiene checklist. This provided an opportunity for the Working Team to develop reporting

Figure 13: The Working Team with their new cleaning gear

skills and also demonstrated the team's interest in personal sanitation.

WaSH Facility

Decision to Implement

Following the unfortunate realisation that we would not be able to move forward with the implementation of the MPC, we reached a turning point in our project. With only two weeks left, we needed a focus for the remainder of our stay. After discussing various options with the Working Team, CORC, and the Municipality, we decided that our time would be best spent focusing on the development of an innovative WaSH facility. The WPI Cape Town Project Centre has had a consistent focus on water and sanitation projects since 2007, and the WaSH team this year prepared by spending seven weeks researching a sustainable sanitation structure. Providing informal settlements with proper water and sanitation is

an on-going struggle, and the community of Langrug is no exception. Currently, there is approximately one toilet for every fifty people in Langrug, and although the Municipality has been working to improve this ratio, it is still far from South Africa's standard of five families per toilet (CORC 2011). Furthermore, the GE Foundation has provided WPI with a grant to spend on an innovative, community-driven sanitation project. The implementation of a WaSH facility would not only meet the partnership's desire to implement a physical structure, it would also address a critical community need, secure an adjacent plot of land for future MPC construction, and establish Langrug as a site for on-going WaSH innovation.

Key Elements

The final WaSH design goes beyond the standard in sanitation by incorporating community-driven aspects with innovative sanitation services. Building off of the 2011 WPI WaSH team's project, we worked with CORC representatives and the Working Team members to design a WaSH facility that could be easily incorporated into the MPC in the future. The facility includes five hand-washing sinks, two of which are lowered for children, four laundry basins in a central area so mothers can watch their children while washing laundry, urinals, two showers, and a total of nine toilet stalls – three each for men and women, two for children, and one unisex handicapped stall. During operating hours, the facility will be moni-

Figure 12: Greywater Health poster created

Figure 14: WaSH area design

tored by a caretaker responsible for cleaning, maintaining, and distributing toilet paper and soap. The WaSH facility will be well lit and secured at night with the possibility of a toilet and tap to be accessible after hours. The facility will be multifunctional and include a children's learning area, a hair salon, benches, and gardens. These characteristics will provide a more welcoming and dynamic communal space; an approach that has proven to increase the longevity and sense of community ownership of such facilities (Hobson 2000).

Figure 15: Push-button flush toilet

Technical Design

The outer structure consists primarily of poles, timber, and zinc sheets; these materials were chosen because they are easy to work with, obtainable at a relatively low cost, and are familiar to the community. The toilets, hand sinks, and laundry basins are made of a composite material that is both durable and aesthetically pleasing. The toilets use a push button, cistern-less design, as shown in Figure 15, reducing the risk of vandalism by concealing the plumbing behind the walls. The facility has been designed with the intention of introducing sustainable sanitation options in the future such as:

- Rainwater collection for hand washing
- Greywater collection and recycling for toilet flushing
- Urine divergent toilets

Construction Process

By the completion of our project, we had erected the main structure of the facility which includes the walls, roof, and concrete slab, and base plumbing infrastructure. In addition to the physical building, we developed plans with the Working Team to continue construction after we leave. Though the facility was ready for the installation of toilets, we felt it best to delay installation until caretakers were trained and employed by the Municipality to ensure the long-term sustainability of the new facility.

WPI, the Working Team, CORC, and the Municipality all worked together in a collaborative partnership throughout the entire implementation process and were able to accomplish an impressive structure in an extremely short period of time. The commitment and immense amount of effort put

Figure 16: Working together to implement the WaSH facility

forth by the Working Team truly showed their dedication and perseverance to the upgrading process. Trevor, a Langrug community leader, rose to the occasion and presented himself as a key force throughout construction. His building expertise and drive was inspirational and will be critical for the completion of the facility. Alfred, another community leader, was extremely hard-working and kept morale high with constant jokes, singing, and dancing. Hendri, a municipal field worker, supported us every step of the way, especially with logistics and design recommendations. Olwethu Jack from CORC was instrumental to the design process and to fostering effective working relationships. The construction of the facility was a true multi-stakeholder process that all agreed had strengthened the Langrug partnership by bringing everyone together to work toward a common goal.

Implementation Challenges

Throughout the construction process, we faced many challenges. The decision to move forward with the WaSH facility left us with only two short weeks to finalise the design as well as finish critical construction. Although challenging, it was fascinating and useful to learn the working habits and building techniques of the Working Team and collaborate with them so they felt responsible for the structure. Furthermore, materials were difficult to obtain on such short notice, and logistical issues of transportation and partners' availability made the process complicated. During the second week of construction, farm worker riots prevented us from reaching the build site for two full days, and when we returned, we discovered that most of our tools had been stolen.

Though these obstacles challenged our timeframe, everyone showed their resilience and pushed to keep the project moving forward.

Construction Phases

The WaSH facility will be implemented in three main phases as presented below in Figure 17 and is projected to take an entire year. We completed the first phase, leaving plans for the partnership to continue construction on to Phase II.

Conclusion

Two months ago, our team arrived in Langrug with the hope of supporting the partnership to develop its many goals and plans. The tensions encountered on our first days exposed the partnership's need to regroup and fortify itself, and after many dis-

Figure 18: WaSH area before and after

cussions, physical implementation became the immediate goal of our work. A tangible project would focus the partners' efforts toward a common objective: regaining partnership momentum.

Several projects considered for implementation were advanced through preliminary planning stages, but ultimately financial and time constraints encouraged the partnership to focus on a WaSH facility. This was a tremendous opportunity for the partnership to show its commitment to upgrading the settlement and allowed WPI to achieve a new threshold in its long-term programme of sustainable WaSH innovations.

Reflection

Above all, we had the remarkable opportunity to witness and participate in a dynamic decision-making process. The collaboration among the partners was never just a simple discussion but an intricate dialogue requiring constant adaptation and cooperation. We all worked as equals; each partner

was acknowledged with the same respect regardless of others' viewpoints. Even as students, we were treated as equal participants in this partnership; we not only had the opportunity to share our experience and skills but were able to adapt and learn from everyone involved.

Our project outcomes were the culmination of every stakeholder's input resulting in a unique final product. While WPI will not be on site when the WaSH facility is completed, the completion process will allow our Langrug community partners to continue improving their internal dynamics and capacity to undertake ambitious projects. External technical, financial, and organisational support, together with the community's cultural and logistical knowledge, set the framework for powerful collaboration. It was fascinating to witness the idea-sharing and working habits of each partner as we pushed forward our many projects. Our cross-cultural learning experience was significantly enhanced by this dramatic and persevering partnership.
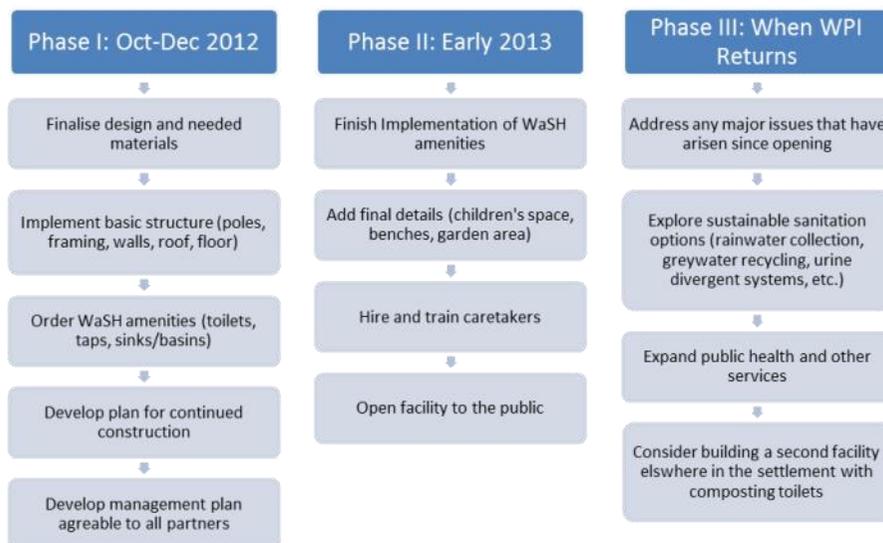

Figure 17: Construction phase diagram

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Supporting Reblocking and Community Development in Mtshini Wam

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

Abstract

The South African government is currently facing immense pressure to provide all citizens with access to housing and basic services. In response to the historically slow and unsustainable system of housing and service delivery for informal communities across South Africa, a process called reblocking was created. The informal settlement community of Mtshini Wam and our sponsor, Community Organisation Resource Centre (CORC), invited us to observe the first reblocking project undertaken in partnership with the City of Cape Town and the Informal Settlement Network (ISN). Our project goal was to support this reblocking process as well as community development. At the partnership's request, we created a guidebook to help streamline this process as the new standard of informal settlement improvement. We also utilised momentum from the reblocking process to implement community driven initiatives addressing issues of food security, entrepreneurial job opportunities, and quality and safety of shack dwelling.

This project summary is part of an ongoing research programme by students and faculty of the WPI Cape Town Project Centre to explore and develop with local partners options for sustainable community development in South Africa.

For our full project report: http://wp.wpi.edu/capetown/homepage/projects/p2012/mtshini-wam

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Background

A housing crisis currently exists throughout South Africa, and as a result, millions of citizens are living in shacks in areas known as informal settlements. These environments pose many health and safety risks, including limited access to clean water and sanitation, coupled with the risk of floods and fire. Despite these conditions, over 3.6 million South Africans reside in informal settlements, which have grown rapidly in the post-apartheid era (Hasselhorn 2012).

The racial policies of apartheid forced many non-white South Africans far from the economic opportunities of the city. In 1994 apartheid ended and the constitution was heavily revised, lifting the geographic restrictions placed on non-white citizens. In response, migration to urban centers in the pursuit of financial opportunity accelerated, and settlements comprised of salvaged material shacks began to develop on both public and privately owned land, including flood plains, road reserves and dumpsites. With the rising number of informal settlements and new constitutional requirements to provide housing and services to all South Africans, informal settlements were finally recognized as a critical state issue. To provide housing opportunities, the government typically proceeded in a mass eviction, relocation and housing subsidy program, as used in the initial upgrade of a Cape Town informal settlement Marconi Beam in the late 1990s.

With little involvement of the community, the government relocated residents of Marconi Beam into subsidized "formal" housing, creating Joe Slovo Park. Many, however, were unable or unwilling to pay for their formal services and either sold their houses or rented their backyards to shack dwellers. Over time, open areas in Joe Slovo Park became dense informal neighborhoods, reverting Joe Slovo Park back to an informal state (Barry 2006).

Joe Slovo Park, located in Milnerton, was a new project site for the WPI Cape Town Project Centre. The project took place in a neighborhood of Joe Slovo Park called Mtshini Wam. Since its creation in 2006, Mtshini Wam has become home to 497 people (SDI 2012). Mtshini Wam is facing many of the same challenges as other informal settlement communities, but is undergoing a very new and innovative method of informal settlement improvement, called reblocking.

Methodology and Objectives: Shared Action Learning

Working in informal settlements presents unique challenges that extend far beyond the distinctive cultural differences between American and South African cultures. Shared Action Learning (SAL) is a Cape Town Project Centre, action research oriented approach to help work within these complex issues by forming strong relationships and actively engaging all stakeholders of the project.

The five processes of SAL are connecting, planning, acting, observing, and reporting with consideration of the social, cultural, and ecological context wherein the project is taking place. These processes are to happen simultaneously in order to facilitate

deeper understanding (Jiusto, Hersh and Taylor 2012). We connected with our partners as suggested by SAL to determine what our project goals would be. Our sponsor asked the project group to focus on researching reblocking and informal settlements during the preparation phase of the project. Community connections, however, only occurred in person because community leaders could not be contacted during the preparation phase. For this reason our project objectives were not clearly defined before we arrived in Mtshini Wam, but instead developed over time using Shared Action Learning on the ground. Through these extensive cycles of the SAL process, the following objectives were created:

- Understand the process of reblocking, the reasons for it and the benefits it provides
- Create a guidebook to help improve the reblocking process
- Implement community development projects in Mtshini Wam
- Create a pamphlet for the community detailing the story of Mtshini Wam's reblocking
- Create certificates that accredit the skills reblocking workers developed.

Project Narrative

The following section of this report focuses on the major accomplishments of our team in Mtshini Wam. To fully understand our project, one must develop an understanding of this new upgrade process of reblocking, because it is in this context that our project takes place. Many of our deliverables and observations are directly related to the reblocking process, while others capitalize on the opportunities created by the re blocking process in Mtshini Wam. For a more detailed account of how our project came together in Mtshini Wam, including both challenges and deep re

wards of cross-cultural collaboration, visit our project webpage "Acts and Scenes" at: wp.wpi.edu/capetown/ homepage/projects/p2012/mtshini-wam/.

What is Reblocking?

Reblocking is a process developed by Shack Dwellers International (SDI) that is based primarily on the spatial reconfiguration of shacks in informal settlements (SDI 2012). Shacks are rearranged and reconstructed to maximize open space in the settlement. Shacks are also often built on raised platforms and the settlements graded to prevent flooding. Reblocking is considered an in-situ process due to its minimal disruption of resident's lives throughout the duration of the project. Reblocking is only made possible by the commitment and manual labour of community members where reblocking is occurring, a very bottom up strategy.

In the case of Cape Town, South Africa, reblocking is made possible by a multi-stakeholder partnership comprised of Non-Governmental Organisations (NGOs), Community Based Organisations (CBOs) and the City of Cape Town. The Informal Settlement Network (ISN) is a CBO comprised of informal settlement residents from across South Africa, who identify and mobilize communities to be reblocked, and provide support during the process. Community Organisation Resource Centre (CORC) is a support NGO who provides financial and technical support to both the partners and community.

CORC, in collaboration with the community, purchases the siding material for each structure through another organisation, iKhayalami. The City of Cape Town provides the remainder of the shack materials through standard issue fire kits, and is also responsible for the installation of hard services, such as water taps and toilets, after reblocking is finished.

Through the Extended Public Works Program, the City of Cape Town hires community members to implement the physical reblocking in conjunction with outside contractors. The result of this partnership is a settlement organised into neat rows and clusters with improved shacks and installation of hard services available to every community member.

Benefits of Reblocking

In Mtshini Wam, we witnessed this reblocking process along with the challenges and benefits involved. We observed clear benefits with respect to fire safety, establishing roads, reducing greywater hazards, creating jobs and inspiring a sense of pride within the community, all discussed below.

New fire-resistant metal structures, coupled with the creation of space between rows of shacks, greatly reduce the risk of fire. These spaces are specifically designed to allow the passage of large emergency vehicles.

The community's soil compacting efforts and introduction of grading to the settlement appeared to reduce the amount of standing water after rainstorms. When we arrived in Mtshini Wam, there were large pools of greywater in the non-reblocked clusters that children would play in, while the pools made walking through the settlement a challenge.

During the demolition of old shacks, grey-

water could be seen pooled underneath residents' shacks, often with rats present as well. The compacted platforms created for
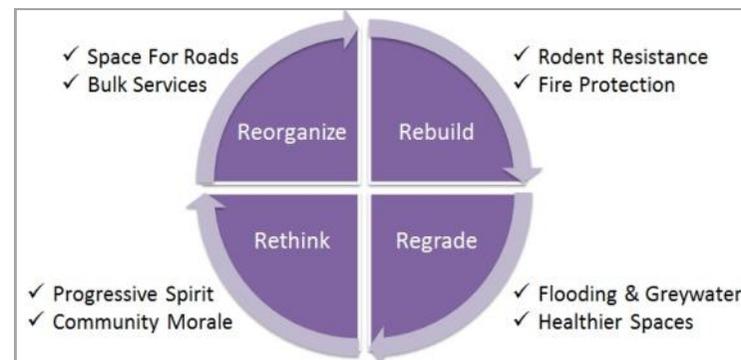
reblocked shacks to stand upon prevent this pooling and have reportedly kept rats from burrowing under community shacks. Living conditions are greatly improved in reblocked clusters and shacks, which are noticeably less damp. Community members told us that they feel healthier since this change in their living conditions.

There is also a shortage of services present in Mtshini Wam as only three taps and

16 chemical toilets service 497 people. During our time in Mtshini Wam only one tap consistently worked. The chemical toilets are cleaned infrequently and due to the sheer volume of people using them, they are unpleasant to use and a health hazard.

The previous arrangement of the original shacks made installing personal taps and flushing toilets nearly impossible. However, the order that reblocking introduces to the settlements eases some of the difficulties in service provision. The government has promised a tap and flush toilet per shack in Mtshini Wam. While technically challeng-

ing, this would be a quantum leap forward from current services, and is made potentially feasible through reblocking.

The partnership makes involving the com- munity possible, as ISN and CORC work directly with the community workers during all stages of reblocking. As a result, the com- munity feels a sense of pride and ownership for what they have created, unifying the community, giving job opportunities to those who otherwise may not have one and creating a sustainable change. As one community leader stated, "we're not just building homes, we're building people."

Opportunities for Improvement

This multi-stakeholder reblocking partnership is in its infancy and while most aspects are working, there is room for improvement. Partners frequently indicated that there was no guideline on how to proceed as they look for methods of improvement. They expressed interest in the creation of a guidebook that details past upgrading techniques and offers recommendations for improvements to future reblocking projects. Being involved in the process with no political or organisational motivations allowed us to gather and analyze information from each partner through meetings, interviews and onsite observation. We used our understanding of re-

blocking in collaboration with the WPI CTPC Langrug group to create a guidebook, supplemented by useful planning tools for communities and suggestions for improving the reblocking process.

Improving Efficiency

We observed in Mtshini Wam that communication amongst partners remained a challenge throughout the process. Clear communication is necessary for the complex process to work effectively, which will be portrayed in each challenge below.

In Mtshini Wam, meetings, phone calls and SMS messages are the main forms of communication in this process. Meetings, as the most formal method of communication, are necessary to keep all partners on the same page. Unfortunately, meetings are often cancelled by the city and NGO partners in particular, as they are spread very thinly across many soon-to-be implemented upgrading projects. The partners have a great deal of responsibility and very limited resources to allocate between projects. As more communities begin to reblock, the need for the partnership to expand and work more efficiently will increase dramatically. The guidebook is designed to systematize processes and maximize information flow between partners to keep everyone informed even if meetings fail to happen.

Core Challenges: Communication, Trust, & Coordination

Theoretically reblocking is a simple process. In practice however, it becomes extremely complicated due to the rich history and perspectives of those involved. South African politics contribute a great deal of difficulty to reblocking. The notion of promises made and not fulfilled counteracts the need for trust-based relationships amongst partners. A lack of trust is especially prevalent between informal communities and politicians. Those from different backgrounds are dealing with social divides and language barriers that also complicate the trust building process.

Bridging Informal and Formal Approaches

The partners each bring their own ways of accomplishing goals based on their experiences and past successes. The residents of informal settlements have become well practiced in temporary building solutions and an ability to improvise. This is in stark contrast to the government's careful, risk-adverse, long-term planning approach. Where informal settlement residents rely on speed, agility, and "good enough" workmanship, the government, especially when developing formal infrastructure, expects much higher levels of precision and durable construction.

Even within government, however, interdepartmental communication and coordinated planning is difficult. For example, Eskom, a public utilities provider, and the Department of Human Settlements, unbeknownst to one another, were both working in the same informal settlement, but with divergent and conflicting plans. The partners recognize that trust and communication issues exist and are sincerely attempting to consolidate their work styles. In the Mtshini Wam reblocking process, CORC sought to balance the technical needs of the city with the abilities and work style of the community by supporting the relationship through training workshops and liaising much of the communication.

This first effort provided an important learning opportunity and we made specific recommendations to improve the design and mapping process. In the initial design process there were instances where access to shacks would have been prevented, yet had the map been more finalised, the design on the ground would not have had to dramatically change. To resolve this problem in the future, we recommend placing doors and toilets on the original mapping design, while also using a large map of the community to mark off areas that have already been reblocked in a very visual manner.

Partners recognize that the biggest challenges with reblocking occur at a management level. They see that each phase of the project demands different levels of informal and formal work styles, which may be a result of varying preferred operation styles. Together we worked to further attempts to resolve this issue by finding the appropriate balance of thorough project planning and on-the-spot problem solving.

Figure 2: The Weekly Planning Form

Acting on Areas of Opportunity

The Guidebook and the specific recommendations we have left the partners present vehicles for process improvement, in which all partners are eager to be involved. Logistical and supply chain issues were particularly challenging. The number of structures demolished and constructed differed week to week, making it hard to schedule longer than a week at a time. This would often result in not enough notice given to the suppliers before the material was required on-site, and families were sometimes displaced for long periods of time during construction. To ensure a more predictable work rate we created work forms and progress tracking tools. The difficulty in this task was finding the appropriate level of planning detail so

that the planning is effective but not such a burden that community members would not use it. Figure 2 shows the very simple weekly planning form that was the outcome of many design improvements culminating the varying work styles of each partner involved.

Immediate progress was made using these tools and considerations. More importantly, progress was made due to the solidification of partner roles as previously, miscommunications and challenges arose over time and the partners addressed them to move forward. We witnessed a dramatic increase in work pace, precision and community morale. In leaving the community and its partners with these new tools for improvement, it is our hope that they continue to gain ground in Mtshini Wam and in the upcoming reblocking projects around Cape Town.

Beyond Reblocking: Community Initiatives

As envisioned by   SDI, reblocking is not just about improved housing, but about strengthening communities, and indeed there is a strong sense of pride and accomplishment amongst the community members of Mtshini Wam for the reblocking process. Through conversations and profiling of community members, the Xhosa term "vugusenzele," or in English "do it yourself," was repeatedly used by community members to describe the new attitude of the community since the planning and implementation of reblocking.

Many of the people we worked with closely expressed a strong sense of entrepreneurship, coupled with a forward thinking mentality. Community members are thinking not just of tomorrow, but of the time after January 31st, when reblocking is expected to be complete, focusing on continued improvement of their living conditions through community driven initiatives. We held multiple sessions with community members about their own "beyond reblocking" visions and distilled from these conversations ideas for four specific initiatives to undertake during our project time:

Gardening: To address the issues of food security and economic opportunity in Mtshini Wam, a Gardening Team was established and with the community we implemented three different types of gardens.

Carpentry: Community members formed a Carpentry Team to pursue entrepreneurial opportunities, and we provided them with skills for furniture design and business principles.

Litre of Light: To address fires and the quality of shack dwelling, we worked alongside the community to install ten solar bulbs in Mtshini Wam, leaving a tool kit and installation manual for mass implementation.

Certification: In collaboration with the reblocking partnership in Mtshini Wam, certificates were created to recognize the workers' participation in their community upgrading process and aid them in future job searches.

Gardening

Gardening was the most constant of our community initiatives, as it remained a top priority of the community members from our first conversation to our last day in Mtshini Wam. It offered a way to both beautify the community, but also provide essentially free food. We liaised with a local designer and agriculture expert, Stephen Lamb of Touching the Earth Lightly, to secure the donation of 18 crated plants for the settlement. To care for the plants upon delivery, community leaders convened a group of 10 interested gardeners. We outfitted this team with basic tools and introduced ideas of vertical gardening.

Through gardening, we supported the abilities already present in the community, as most gardening team members had prior experience. Through continued collaboration with Stephen Lamb, the community was offered a subsidized vertical garden with the financial support of the CTPC co-researcher budget, the design concept from Arlo Mitchell of Greencube Landscapes and Gardens, and a sustainable worm composting bin donated by Global Worming. The vertical vegetable provides a space saving way to improve food security, while further reducing the risk of shack fires. It was difficult to gain acceptance of this idea, due to community hesitations about what was really being offered. Knowing the community would miss a valuable opportunity if

they rejected the idea, coupled with the pressure we felt to deliver something tangible to the community through our project, we explored the idea through drawings and extensive back and forth conversation. In doing so we were able to negotiate and compromise on the installation. This installation culminated in a major publicized event, which highlighted several other community initiatives as well.

We provided the Gardening Team with tools through our co-researcher budget, a "Worm Farm How To" manual, a Gardening Team "Plant Care" schedule, tool tracking documents, and other inexpensive ideas for vertical gardening. Finally we discussed future planning of produce sales in Mtshini Wam and neighboring communities as an entrepreneurial enterprise.

Litre of Light

The community voiced the need for windows and lighting solutions. We observed that many people must open their doors during the day to light their shacks, allowing sand blown by the wind into their home, and learned that
candles have caused major fires within the community. Most residents are unable to install windows due to high cost or fear of having their shacks broken into. To address these issues, we investigated Litre of Light,

an innovative, electricity free lighting source that provides affordable and safe lighting to low-income shacks (aliteroflight.org). The Litre of Light solar bulb is created from a soda bottle filled with water and installed in the roof, employing the property of refraction to disperse sunlight into the shacks.

They provide an inexpensive way to bring light into dark spaces without installing windows, while eliminating the security risk and need for daytime candles.

After an in-depth discussion, three community members decided they would like to try the solar bulbs. With help from Touching the Earth Lightly, nine lights made their debut at the big event, attracting much of the day's attention (Cape Argus 2012), as they cost only R34 to install and were some of the first Litre of Light bulbs to be installed in South Africa. We supplied the community with a tool kit of essential supplies necessary to install the solar bulbs, and a step-by-step instructional manual. The bulbs also provide an opportunity for the Carpentry Team to install the lights and make a small profit.

Carpentry

A group of residents wanted to turn their skills and interest in carpentry into an entrepreneurial opportunity after their contracts with the EPWP end, and so in the same spirit as the Gardening Team, a Carpentry Team was created. The team showed us multiple examples of their work including a chair and desk, explaining that they would like to build new doors for Mtshini Wam and also for other reblocking communities. After many discussions involving budgeting and general fiscal planning, it was agreed that WPI would also fund tools for this group through our co-researcher budget. These tools would not only be used for carpentry, but also for the reblocking effort, gardening and Litre of Light

as both gardening and carpentry would afford entrepreneurial opportunities in the future . We designed and built shelves with the Carpentry Team that were specially designed to hold crated plants in a vertical fashion, while still allowing access to sunlight. To aid in the long-term success of the Carpentry Team, we provided instructional pamphlets, tool tracking documents, and hands-on training sessions.

Certificates

Certificates were the final community initiative our team pursued. Community members had indicated that certificates of participation in the reblocking of Mtshini Wam would hold great value to the community workers. Certificates could supplement future job applications and provide recognition of the hard work and learning accomplished by each individual. We created certificates and arranged for the City of Cape Town, ISN, CORC and WPI to all give signatures of key personnel. This certificate could potentially serve as a model for certificates of reblocking in other upgrade sites, perpetuating the self-improvement mentality resultant from the reblocking process. On our last day in Mtshini Wam we held a ceremony to hand deliver the certificates to each individual. The pride and excitement community members felt was evident in their celebration, which involved singing and dancing.

Conclusion

The reblocking process is an extremely difficult community based, multi-stakeholder project that has had great success in Mtshini Wam. We have seen the transformation of a ramshackle settlement with no hope of basic service installation into a cleaner and safer organized space. The partnership we were invited into has proven itself extremely capable and willing to meet the demands of informal settlement upgrading.

We believe that the partnership should continue to reblock communities using Mtshini Wam as a model of success at the end of a long, hard road. Mtshini Wam, like every informal settlement, brings its own unique assets and challenges to the process. Having an uncommonly strong leadership and a very motivated community has certainly helped make reblocking a success there. We feel a greater risk of failure is present in reblocking projects without such leadership and community cohesion.

We encourage partners to support community initiatives to improve community member's lives when reblocking ends. These projects can range from food security to crime prevention to improving the aesthetics of their community. Such projects manifest the forward-thinking mindset reblocking appears to promote in community members and partners. By helping community members start their own projects, the partners are channeling the enthusiasm that comes from reblocking into sustainable initiatives that will foster this progressive spirit even when reblocking is over.

Just as our guidebook tools were adapted as often as possible to meet the needs of Mtshini Wam, so too must the process and guidebook be adapted for other projects. With the reblocking partnership keeping up strong communication and a focus on systematic process improvement, we are confident reblocking will become a more streamlined and replicable process even when used in many varying contexts. In conclusion, we support the continuation of multi-stakeholder reblocking in South Africa and hope that our contributions will help make it a sustainable upgrading technique.

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Acknowledgements

Capacity Building of a Community-Based Organisation in Maitland Garden Village

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

Abstract

Maitland Garden Village (MGV) is home to a small community which faces social challenges including idle youth and unemployment, factors contributing to major problems such as substance abuse and teenage pregnancy. The purpose of this project was to work with the MGV community-based organisation, the Green Light Project (GLP), to create a vision and plan for a community Help Centre that would address these problems. We sought to accomplish this by establishing a good working relationship with members of the Green Light Project, utilising the current assets of the organisation and the MGV community, and making new relationships with various stakeholders within and outside the community. With these internal and external partners we were able to analyse possible venues for the prospective Help Centre facility, construct an extensive resource book on community-based organisation (CBO) sustainability, secure a temporary venue for existing GLP programmes, develop a youth music programme connecting the GLP with a city after-school initiative, and set up a system that gives GLP members the opportunity to develop proposals for future projects.

This project summary is part of an ongoing research programme by students and faculty of the WPI Cape Town Project Centre to explore and develop with local partners options for sustainable community development in South Africa.

For our full project report: http://wp.wpi.edu/capetown/homepage/projects/p2012/mgv/

For more about the Cape Town Project Centre: http://wp.wpi.edu/capetown/

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Juliana Fekete		MGV Green Light Project
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Figure 1: Maitland Garden Village

Problem Statement

Although poor living conditions and limited opportunities are especially prevalent in South African informal settlements, these challenges are also encountered in formal settlements. One such formal settlement is Maitland Garden Village, a small urban coloured community located on the outskirts of Pinelands, a suburb of Cape Town. Founded in 1922, Maitland Garden Village is home to about 1,600 residents, including backyard tenants, those who illegally reside in shacks in the backyards of residents (Galant).

MGV is in several ways a close-knit community. Many of its residents were born and have grown up in the village, and this familiarity provides a strong basis for community action. Despite these strengths, MGV, similar to disadvantaged communities elsewhere, struggles with a high unemployment rate, geographic and social isolation, drug and alcohol abuse, and teenage pregnancy.

Last year in 2011, a WPI project team worked in MGV for the first time to address these problems and to strengthen the community by using the approach of asset-based community development. By utilising the strengths of the MGV community, the group teamed up with community members and created the Green Light Project, a grass-roots community-based organisation, whose mission is to give greater purpose to the lives of all residents through the introduction and development of programmes to improve skill levels (especially among the unemployed youth), to address idleness and the resulting social problems, and to create greater self-respect, social cohesion and

Figure 2: Green Light nine Projects

community responsibility. The GLP looks to advance this mission through its nine projects (figure 2).

To build upon the success of its first year, the Green Light Project is at a stage where it needs to make choices about programme direction, management, fundraising, motivating volunteers, and working with other organisations in Maitland Garden Village. Having regularly run programmes throughout the week, including a walking club, gardening club, awareness workshops, and fitness programmes, the GLP feels the greatest asset they are lacking at present is a permanent venue of their own. With this in mind, the GLP is looking to expand upon its programmes and to begin the search for a venue with the vision of turning it into a community Help Centre.

Project Goal

The goal of our project was to strengthen the skills and competencies of the MGV Green Light Project and help the organisation develop a more extensive network of external relationships with city agencies, potential funders, and other community organisations. To achieve this goal, we sought to help the Green Light Project consider the feasibility of establishing a Help Centre to serve as a place where people could go to participate in enriching programs and to obtain information and support for dealing with personal problems.

Project Partners

Our WPI student team consists of Andrea DiGioia, Edmund Eduah, Juliana Fekete, and Andrew Lamb and was advised by Professors Scott Jiusto and Bob Hersh. On site, we were guided in our work by our MGV sponsors Ronell Trout and Sheila Galant while working in conjunction with Green Light Project leaders and participants. We were aided in our work by the WPI Cape Town Project Centre liaison Basil Tommy and City of Cape Town Department of Social Development assistant professional officer Jennifer Stacey. We also gained valuable insight from MGV community members and organisations.

Shared Action Learning: An Interactive Approach

This year at the Cape Town Project Centre, we have newly implemented a strategic

ap-   Figure 3: Green Light Project Leaders

proach for social interaction called Shared Action Learning. Shared Action Learning (SAL) is an approach that puts the interests of the community at the center of the project. The approach entails mutual learning, action, and reflection among all individuals and groups involved in the effort. Though helping to guide the project, SAL does not guarantee it will run smoothly or be successful in achieving its initial goals. Working in low income communities, CBO leaders are often overstretched; and it can be difficult to generate volunteer commitment. As

a result it was important that throughout our time in MGV we were patient and flexible as we tried to find direction for our project and opportunities to work closely with community members. This meant at times letting go of what we had hoped to accomplish and instead focusing on what could be accomplished with the resources available.

Project Outcomes

Figure 4: Edmund working with sponsors

We were able to accomplish the following:

1. Made positive connections with Green Light Project members and learned about the current status of the organisation.

2. Analysed the pros and cons of possible venues for an MGV Help Centre.

3. Helped the GLP make contact and explain its plans to other community and faith-based organisations in MGV.

4. Secured a time slot for the GLP at the existing Community Centre to serve as a venue for short-term initiatives through a youth singing and dancing programme.

5. Developed a resource book for GLP future initiatives.

6. Put in place a programme to strengthen the GLP members' proposal writing skills which can lead to more effective programme development

Connecting with Maitland Garden Village Residents

Entering MGV, our group had the understanding that we needed to establish a positive, open, and trusting relationship with our sponsors Ronell and Shelia so that we could successfully support them and their visions for future Green Light Project initiatives. As a result, our first couple of weeks focused on making connections with the women who we found to be friendly, passionate, and dedicated to their organisation. Through guided tours of MGV, our attendance at MGV's 90th annual Village Day, a community-wide celebration of the village, and a meeting with the GLP leaders, we were introduced to several community members who expressed the same welcoming spirit. These three encounters were successful in helping us make connections with
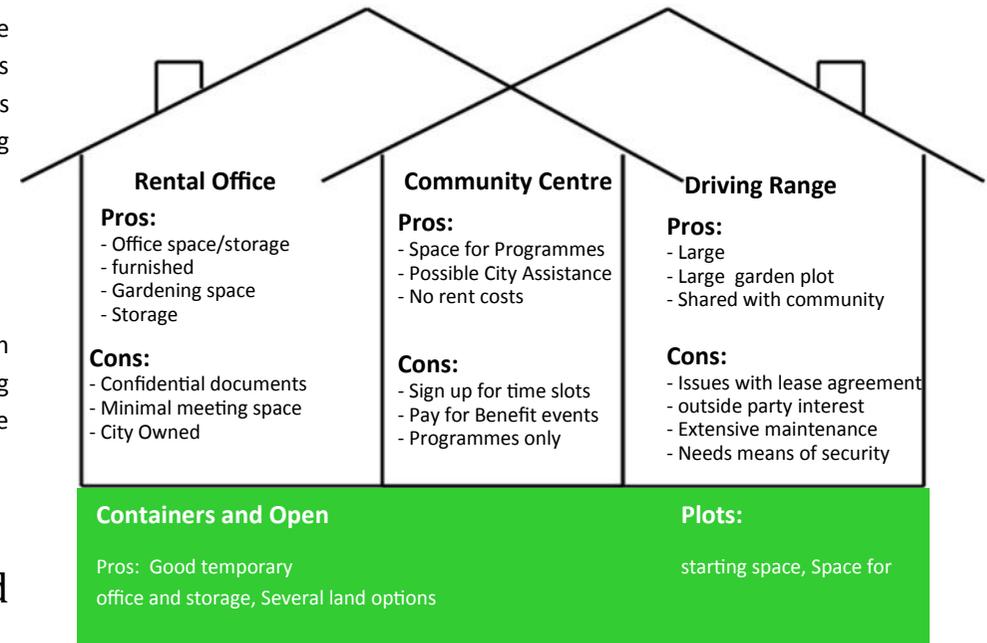

Rental Office
Pros:
- Office space/storage
- furnished
- Gardening space
- Storage

Cons:
- Confidential documents
- Minimal meeting space
- City Owned

Community Centre
Pros:
- Space for Programmes
- Possible City Assistance
- No rent costs

Cons:
- Sign up for time slots
- Pay for Benefit events
- Programmes only

Driving Range
Pros:
- Large
- Large garden plot
- Shared with community

Cons:
- Issues with lease agreement
- outside party interest
- Extensive maintenance
- Needs means of security

Containers and Open

Pros: Good temporary office and storage, Several land options

Plots:

starting space, Space for

Figure 5: Venue Analysis

the community and understand the current status of the GLP by:

- Helping us to establish open communication lines with our sponsors

- Allowing us to witness the many talents of the local people

- Giving us a sense of the drive and motivation of MGV's community leaders

- Informing us that the Green Light Project was in the process of becoming an NGO

While we gathered the information above, we learned from the GLP leaders that there was a want and need for a Help Centre. We learned that GLP leaders dedicated a considerable part of their time each day to vol-

unteer services for MGV community members such as responding to calls to intervene in family matters, helping the elderly find their way to the hospital, and sending children on the streets to school.

As a result of our interaction we focused on two project directions:

- Identifying and analysing the availability status of potential venues

- Gaining a deeper understanding of the GLP and considering ways to enhance its current programmes

Analysing Possible Venues for a Maitland Garden Village Help Centre

Through interviews and meetings with Ronell and Sheila, Green Light Project members, and other key MGV community members, we gathered perspectives as to why there should be a Help Centre in MGV and what programmes should be provided by the facility. A general view among community members was that the main purpose of the Help Centre should be to get children off the streets by providing opportunities for fun activities and skills development on a regular basis. Some key long-term goals for the Help Centre that came from these encounters include:

- Implementing a mobile clinic to care for sick and injured community members

- Obtaining sports equipment and creating more opportunities to play a vari-

ety of sports

- Obtaining instruments and form a youth band within the community

- Organising education classes for adults, enrichment programmes for youth, and special programmes for those who are mentally disabled

- Recruiting trained counselors to provide training programmes including those for creating a CV, finding a job, and starting up a business

- Growing a community vegetable garden to provide food for a feeding scheme and to sell produce to encourage social entrepreneurship and business creation

- Having the centre serve as a destination for visitors and tourists to come and learn about the unique heritage and community dynamic of MGV

An important focus of our project was to assess the suitability of different venues to accommodate these ideas. The GLP leaders

Figure 7: Stakeholders at community meeting

believed a Help Centre was the key piece in expanding their organisation. We learned that they were currently operating out of a few different venues including members' homes, the Methodist Church hall, and the MGV Community Centre. During our meeting with the GLP leaders we identified three additional venues that they felt could be feasible. A description of each venue and its pros and cons can be seen in (fig). With the identification of these possible venues, we began putting together a proposal with the intentions of sending it to the city. In developing our proposal and through meetings with our sponsors, advisors, and Jennifer Stacey from the City of Cape Town's Department of Social Development, we began to see the Help Centre not simply as a GLP initiative but one that could serve the broader MGV community, including other groups working on social development. To learn more about the views of other MGV community groups on the question of a Help Centre, we helped organise two key meetings between GLP members and other community organisations such as the Residents Association, Soccer Club,

Figure 6: Potential Venues (clockwise from top left: Driving Range Building, Container, Rental Office, Community Centre

Friends of Daniel Kingdom Church, St. Athanasuis Church, and the Methodist Church.

Connecting with other Community and Faith-Based Organisations in Maitland Garden Village

During the process of searching for a venue and compiling our proposal, we found it necessary to not only work closely with
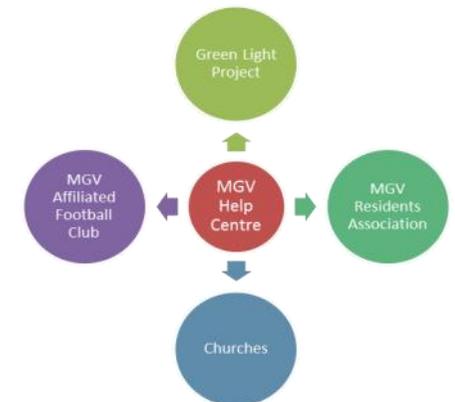

Figure 8: Potential help centre partners

members of the Green Light Project but also to identify and collaborate with members of other MGV community organisations. Two community meetings were held on the evenings of November 8th and November 15th between the Green Light Project and representatives from other MGV organisations. Entering the meetings, it was our hope that we would leave having:

- Identified that members of the community beyond the GLP felt there was a need for a Help Centre

- Created a detailed schedule of the activities that would be held at the Help Centre and the organisations that would oversee them

- Considered how the Help Centre could be managed

There was unanimity among the various stakeholders of the need for a community Help Centre and an interest in better coordinating activities across groups. There were disagreements, however, about what organisation should spearhead the effort to set up and manage a Help Centre. The disagreements revolved around notions of legitimacy,

Figure 9: Children using computers during music program

seniority, and which organisations it was felt best represented the broad interest of MGV. It was very interesting to witness these meetings and learn about the deeper, more complex connections among members of the community at large we were unaware existed. Though it has yet to be resolved which group could manage the Help Centre, the meetings at least brought these disagreements into the open and paved the way for more substantive discussions in the coming months.

Creating a Youth Dancing and Singing Programme

With the conclusion of the two community meetings and further investigation into the activities of the GLP, we determined that at this point the Help Centre idea was a long-term initiative for the organisation. In addition to our work on the Help Centre, we wanted to implement something on the ground during the time we were in MGV. As a result we shifted our focus to what we could do for the Green Light Project at present and how our initiative could serve as an inspiration for future activities and model programmes at the Help Centre. This change of focus was tied to our own learning as a team. Working with community stakeholders, we made the following key observations:

- The Community Centre in MGV provides enough access time for current GLP programmes

- The GLP needs to increase the quantity of ongoing programmes for the need of a venue to be justified

- The GLP needs to find better ways to

Figure 10: The extreme dancers during GLP and WPI concert

reach more community members

- The GLP is lacking in the development of organisational skills

Taking note of each observation, together with the Green Light Project, we shifted our focus to starting up an activity at present that they could continue after we returned to WPI. Building upon the immense musical and dance talent we witnessed among the youth at Village Day, we started a youth music programme that met in the Community Centre for two hours, three days a week. This programme was linked to a city after-school initiative where a city staff member was expected to design and run activities for children. The programme was successful in that it:

- Generated enthusiasm from both the city staff at the Community Centre and

the MGV youth

- Serves as a model for how the GLP could develop its programmes by leveraging municipal resources (staffing, venue)

- Strengthened the GLP link to the city and its ongoing municipal funded initiatives targeted at after school programming

On the evening of December 13th, we held a concert at the Community Centre where the programme participants performed for a group of community members. Due to the positive reaction of the very big audience, of which the large majority were children, we anticipate that participation and support of the programme will continue to grow after we leave.

Although we were successful in initiating a

programme the MGV youth positively responded to, we realise that if we had more time in MGV we could have further developed the project in several ways. For instance, we might have been able to create a small group of committed community leaders, or even collaborate with the city workers at the Community Centre to help municipal staff develop the initiative. In addition, we could have spent more time publicising and getting more support for the programme by contacting local schoolteachers and other MGV organisations such as the Residents Association. To advance the programme in the future, we hope that the GLP leaders will take it upon themselves to collaborate with the city staff as well as other community groups and potential programme leaders so that it can gain support, be run efficiently, and remain sustainable.

Figure 11: Resource Book cover page

Developing a Resource Book for the Green Light Project

Having spent weeks going through the process of closely analysing each possible venue for the proposal, we decided to make use of the work we had and use it to help the GLP develop their organisational capacity. We did so by taking aspects of our proposal and compiling the information into a resource book incorporating the physical pros and cons, opportunities for use, operational problems, and status regarding each venue. The book also contains instructions on writing a proposal or grant application and resources the GLP can use to do so. The resource book focuses on the following key features:

- Short and long-term goals for programme development

- Help Centre venue analysis and management plan

- Financial management strategies

- Future programme development ideas and strategies

The resource book, we hope, will enable GLP leaders and others to think through organisational priorities, manage current programmes, and seek external funding.

Strengthening Proposal Writing Skills

The Cape Town Project Centre has made a commitment to provide 10,000 rand (approximately 1,150 US dollars) to fund GLP programmes that advance the development of the organisation and MGV community more broadly. To access the funding, the GLP will submit written proposals to the CTPC to explain how the funding will advance programme activities and strengthen the organisation. The proposals will include a narrative of the project, project goals, intended impacts, and budgets. The GLP will
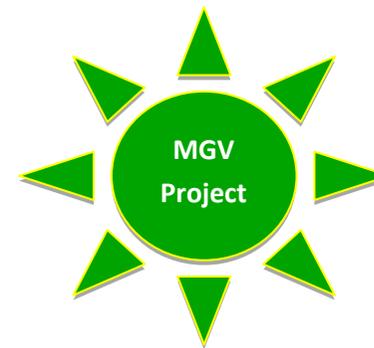

Figure 12: Green Light Project Logo

be expected to provide project updates to encourage its relationship with WPI. Through this effort, the Green Light Project will gain practice in writing proposals, and more importantly, discuss strategic directions for the future.

Moving Forward

As the Green Light Project waits to hear back from the provincial government regarding approval for a NGO registration number, we are hopeful that the organisation will continue to provide community development programmes. We hope that the members will use our resource book to organise and develop their initiatives and when the time is appropriate, pick out rele-

vant information to compile proposals for WPI funding and eventually a Help Centre venue.

The Green Light Project will have additional opportunities once it becomes a registered NGO. The group will be able to apply for much needed funding from the municipality and from private sources. The organisation could acquire equipment and supplies for further programme development, such as community gardening, youth sports and education, and computer literacy, while committed Green Light Project volunteers could eventually obtain stipends. In the event that a MGV Help Centre is established as a registered NGO, the Green Light Project could act as an umbrella organisation and invite other MGV community members to apply for external funding for projects of mutual interest.

Reflections and Recommendations

While being a fun and exciting experience, working in MGV with the Green Light Project opened up our eyes to the many struggles and obstacles grassroots community-based organisations face in any disadvantaged community on a daily basis. With limited guidance, resources, and funding, mobilising a voluntary initiative and building the capacity of these organisations is a long and complicated process that takes a lot of dedication and patience, which our sponsors have shown. At times, however, we were unclear about the direction of our project and felt frustrated that we seemed to gain little traction with others involved in the GLP and with other groups in MGV.
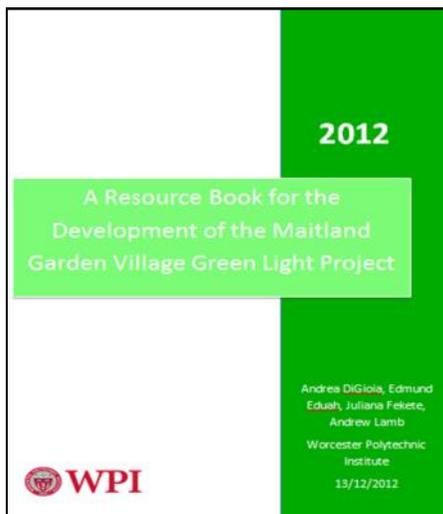
witnessing the social dynamics of the community, we wish we had worked harder to branch out and connect with more community members, in particular by forming deeper relationships with members of the Green Light Project, aside from the executive council. This would have allowed us to gain a more holistic perspective of how the GLP was fairing. We found this difficult due to the fact that many members worked during the day when we were present in MGV and did not attend the GLP meetings at night. We tried to make connections with stakeholders of other organisations but ran into similar constraints. Had we observed this earlier, we would have been more persistent in scheduling face to face interviews when we were in MGV and scheduling telephone interviews with those who worked during the day.

Assuming that the close-knit nature of the community would result in smoothly run meetings was another shortcoming of ours. In doing so, we were unable to anticipate the differences in perspectives between the GLP and other community organisations. It would have been very useful to have had individual meetings with the other organisations, where we could have introduced and explained our project to them prior to the first community meeting. This may have helped us to better understand their interests and intentions with the centre.

Working on this project allowed us to realise that sometimes the intangible achievements are the most important. Just as the stability of a house depends on the strength of its foundation, the same holds true for grassroots non-profit organisations. Building a solid, strong foundation for the long-term growth and sustainability of an organisation is critical, and we believe that the work we have done over the seven weeks in MGV contributed greatly to that foundation.

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Envisioning a Black River Pathway: Creating a Heritage Destination through Social Development

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

Abstract

Maitland Garden Village (MGV) and Oude Molen Eco Village are two geographically and socially isolated communities located along the Black River. The goal of this project was to link pathway development along the Black River to community development through increased tourism and support for community gardens. In collaboration with the MGV and Oude Molen communities, and our sponsors, the City of Cape Town's Environmental and Heritage Management Department, we developed a pathway plan that incorporates community gardening, walking tours, and builds on the community assets found in MGV and Oude Molen. This project helped to connect key stakeholders and generate interest in creating a pathway.

This project summary is part of an ongoing research programme by students and faculty of the WPI Cape Town Project Centre to explore and develop with local partners options for sustainable community development in South Africa.

For our full project report: http://wp.wpi.edu/capetown/homepage/projects/p2012/pathway/

For more about the Cape Town Project Centre: http://wp.wpi.edu/capetown/

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Introduction
Project Goals

This project has three major goals that were developed in conjunction with key stakeholders. The goals are community supported, strategic, and can be implemented in both the short and long term. These goals are as follows: incorporate and build on current gardening initiatives; increase connectivity throughout Two Rivers Urban Park (TRUP); identify current community assets in MGV and Oude Molen as a basis for a walking tour.

Our Partners

This project was a combined effort of multiple stakeholders. We worked closely with the City of Cape Town's Environmental and Heritage Management Department, represented by Crispin Barrett, Juan Nomdo, and Clive James, as well as the Green Light Project, represented by Ronell Trout and

Figure 1: Oude Molen Eco Village signage

Figure 2: Houses in Maitland Garden Village

Sheila Galant. We also worked regularly with Megan Lukas from the Environmental Resource Management Department who serves as a representative on the Two Rivers Urban Park Committee. As a university project, our advisors, Scott Jiusto and Robert Hersh, guided project development during both the preparatory phase and implementation phase in Cape Town.

Background

The Black River became polluted when it was canalised in 1943 by the City of Cape Town (Gravel *et al.*, 2011). This directed pollution from industries located upstream to contaminate the entire river. Similarly, surrounding river communities experienced social and economic marginalisation at the hand of rapid urbanisation. This has caused the City of Cape Town and communities surrounding the river to begin looking at restoration projects, such as projects focused on tourism, heritage, and agricultural opportunities that can connect visitors to the Black River corridor, mak-

ing it a destination. The city's hope is to use agriculture and tourism as a way to improve employment and social opportunities. Our project explores ways to revitalise the Black River and surrounding communities through a linked process.

Our project continues the work done in 2011 by a WPI student team in the Cape Town Project Centre. That group initiated planning a pathway along the Black River corridor. Our project focused on a smaller scope within the corridor to more thoroughly evaluate pathway opportunities as they pertain to the specific development of Maitland Garden Village (MGV) and Oude Molen Eco Village communities. These communities are located within the Two Rivers Urban Park (TRUP), the area surrounding the Black and Liesbeek Rivers as well as the additional communities of Alexandra Hospital, Valkenberg Hospital, and Observatory. A common theme between these projects is that the community is a large and necessary impetus in path-

Figure 3: Desire line in the wetlands

way planning processes to create a sustainable effort (Delgado, 2005). See Figure 7 for a map of this area.

Key Outcomes

Our team experienced successes and met challenges while developing the pathway vision. The key outcomes of these experiences are as follows:

1. Facilitated connections between Maitland Garden Village to the Two Rivers Urban Park Committee and several city departments.
2. Generated interest throughout multiple city and community organisations by meeting with and/or presenting to stakeholders.
3. Identified possible attractions within Maitland Garden Village and Oude Molen Eco Village to help develop the area as a destination.
4. Drafted and submitted a pathway vision proposal to the City of Cape Town's Environmental and Heritage Management Department.
5. Created a sample pamphlet for a featured walking tour through Maitland Garden Village and Oude Molen Eco Village and designed key interpretive signage for the area.
6. Reflected on notable events throughout the project for our team's website.

Shared Action Learning

This project is guided by Shared Action Learning (SAL), a philosophy used by all 2012 CTPC projects. SAL provides a way to think about and engage in partnerships with stakeholders. This method focuses on sharing knowledge, ideas, resources, and inspiration; taking action

Figure 4: Learning from Oude Molen resident

that supports creativity and community growth; and learning from our interactions and research through group and personal reflections (Jiusto, S., Hersh, R. & Taylor, S, 2012). It combines initial background research and planning, with action and project reflection in Cape Town.

Sharing ideas with, interacting with, and learning from our sponsor and other stakeholders helped us understand many views about the potential for a pathway. Hearing the perspectives on the project from both the city and MGV community increased our understanding and helped us serve as a bridge be-

tween the community and the city. Our key partners for collaboration were our sponsor liaisons, MGV and Oude Molen community members, and another student team working in MGV. In the early stages of our project, there was extensive collaboration between our team and these partners, especially community members. Our time spent in MGV and Oude Molen, whether it was walking the desire lines, hearing about gardening heritage, or listening to community stories, helped us understand community dynamics and needs through active observation. Collaborating with the city and communities provided a solid foundation for us to execute the main deliverable of our project, the pathway vision proposal.

The Journey

Our project involves a seven week preparatory phase at our university and a seven week implementation phase in Cape Town. The following is an account of our journey.

Preparatory Phase

Our preliminary research focused on urban agriculture, tourism, and pathway design elements. The urban agriculture aspect mainly focused on community supported agriculture (CSA), a scheme where buyers enter a mutual agreement with growers/sellers, which guarantees a source of income for the grower and a source of food for the buyer (Thornton, 2008). Our interest in tour-

ism for the pathway vision stemmed from the possibility of ecotourism and a walking tour through Maitland Garden Village and Oude Molen. Walking tours are an effective way of bringing visitors to the area and showcasing community assets (Wong, 2001). Our team also looked at multiple river restoration efforts, notably the Bronx River, Spicket River, and South Platte River. A common theme between these efforts is that the community plays a large role in the clean-up and design process (Renn, 2008). Collectively, these research topics guided us through the initial phases of our project.

Experiencing MGV and Oude Molen

Arriving in Cape Town, we strived to build good working relationships with Maitland Garden Village residents. Our community liaisons, Sheila Galant and

Ronell Trout, facilitated interactions with community leaders, youth, and elderly residents. As our project developed, heritage became an important aspect to incorporate into the pathway planning, so we used community connections to gather information. We discussed both the agriculture and social history of the area with the community members and learned more about their life experiences in MGV. This notion of heritage complemented the more customary notion that heritage related primarily to a community's architecture, its built environment. Community members felt it was important to highlight the long held gardening competitions and home vegetable and flower gardens, while our sponsors initially focused on MGV's unique domestic architecture. We learned that in the 17th century, MGV land was used for farming and supplied Dutch shipping companies

Figure 5: WPI students with MGV gardeners

Figure 6: MGV community member showing students around community footpaths

and in the 20th century, MGV residents held gardening competitions. Community members recounted stories where winners of the gardening competitions were awarded prizes such as fruit trees. In the pathway proposal, we reflected MGV's rich agricultural history by providing plans for community gardens.

We also learned about the role that previous residents played in the World War I Battle of Delville Wood, a historically significant battle where South Africans fought alongside the British. Parts of MGV were originally built in the early 1920s as housing for soldiers returning from the Battle of Delville Wood, so the architecture of the houses mirrors British World War I semi-detached homes. Community members were proud to narrate stories of their fathers'

roles in the battle and their lives growing up in MGV. Such a rich link to South African history made a strong case for MGV to be recognised as a heritage destination. We suggest this part of South African history be incorporated into the pathway through a memorial attraction.

We also walked along informal footpaths, or desire lines, to envision what a Black River pathway can look like. A member of a community based club, the Roaring 60s, guided a tour through these desire lines and along the M5 highway. From this tour and from other residents' accounts, it was clear that the pathway could be of great benefit to community members, particularly because it could increase the level of gardening and recreational activities in MGV. It would especially help to keep

youth occupied during the holidays, which is a major concern for many parents and older community members.

During our tour, we came to understand a prevalent issue currently facing MGV residents. We noticed that the desire lines often led to the M5 highway but there is no safe way to cross the multiple lanes of traffic. Residents hope to regain pedestrian bridge access over the M5, which would greatly improve their access to leisure activities as well as improved public transportation on the other side of the Black River. Presently, children cross during their summer holiday to access a pool, and many other residents cross to access public transportation, hospitals, the bird sanctuary, and the astronomical observatory. The previous pedestrian bridge was demolished when the highway was updated and the Valkenberg Bridge, accessible from Oude Molen, was originally intended for pedestrian use. However, the community has found that their

Figure 7: Sheila, Lorenzo, Ronell

attempts to cross the Valkenberg Bridge are refused. Consequently, our proposal includes recommendations for allowing pedestrian access across the M5 and Black River to reflect the MGV and Oude Molen community's needs.

Mapping the land

We were able to incorporate community assets and residents' visions for the pathway through the use of mapping programmes provided by our city sponsors. Having been on numerous walks along the desire lines in MGV and Oude Molen, we understood the layout of the area and how we might plan a pathway including the two communities and their assets. The amount of planning necessary for the pathway map design required that we work with a technical assistant from the Environmental and Heritage Management Department. We first needed to determine property boundaries, owners, and ratepayers in areas that could potentially be useful for gardening initiatives. We were able to know who owned different plots of land that we wanted to include in our pathway using a programme called ISIS. This programme also allowed us to see the zoning, such as land designated for residential development. With ArcView, a GIS mapping software, the city technical staff helped us develop maps suitable for expressing our pathway plans and, later, recommendations included in our proposal. This can be seen in Figure 7.

Meeting with Stakeholders

A critical part of this project was meeting with several stakeholders to discuss options for the pathway. Our team met regularly with the Green Light Project and the City of Cape Town's Environmental and Heritage Management Department. Additionally, we met with several other city departments to discuss their involvement with the project:

- Storm Water Management to discuss issues with the water hyacinth on the Black River and possible removal alternatives
- Parks and Recreation to discuss the possibilities of a gardening agreement with the MGV community
- Property Management to discuss the potential for a community garden on the old MGV driving range land

We also presented our vision to the Sustainable Livelihoods Network, a department that promotes initiatives for livelihoods in an environmentally friendly way; the TRUP Committee, a coalition of residents invested in the areas of TRUP; and the TRUP Steering Committee, a committee of various city and province officials, politicians, and select members of the TRUP committee. Table 1 summarizes our gained perspective from key stakeholders.

We frequently met with the Environmental and Heritage Management De-partment and the MGV community. These interactions shaped our project expectations and allowed us to integrate these expectations into a pathway proposal to spark future interest in the project. The city was interested in surveying MGV as a potential heritage site. MGV community members were largely interested in using the pathway as a tool for the city to begin housing updates. If MGV were made a heritage site, then the community members hoped this would force facility updating. Ultimately, we formed connections with these groups and fostered a future relationship between the city and MGV community to collaborate with one another regarding these issues.

While this was the first occasion hearing about a Black River pathway for many, we were invited to meet with and present to multiple interested organisations. These meetings afforded us a greater understanding of perspectives involving the pathway idea and proposed land usage. For example, the Green Light Project was focused on a specific site for a community garden and help centre at the start of the project period. As our team attended city meetings, it was clear that other land considerations were necessary due to ownership complications. Different city departments expressed varying perspectives as well. For example, when we

Table 1: Stakeholder perspectives

The Green Light Project

- The Green Light Project is very enthusiastic for the pathway because of the opportunities it will bring to the MGV community. While they would like to see more progress, they are still hopeful that plans are moving forward.

Environmental and Heritage Management Department

- Our sponsor felt that the pathway vision had potential to connect communities within and surrounding TRUP. This involves many different city departments, so it would take time to finalise a vision and allot funds to build it. They are optimistic about our pathway vision serving as a next step in the pathway building process.

TRUP Committee

- The TRUP Committee is interested in our pathway vision as a way to connect TRUP. They provided suggestions to help move the project forward, such as exploring other types of agriculture and meeting with different stakeholders who could be helpful.

Parks and Recreation

- A representative from Parks felt that the gardening aspect of the pathway vision was feasible. Gardening on city land would involve transferring land to Parks to create a public open space and drafting an agreement between MGV and the Parks department. They thought gardening in combination with a pathway would be beneficial to the community.

Storm Water Management

- This department felt that using a pathway to stimulate ecological restoration of the river wasn't practical. They also felt there was no permanent solution to the water hyacinth problem in the river. They did not have a strong opinion on the pathway itself but indicated there was little that could be done with respect to the river's pollution.

Property Management

- Property Management has recently learned about land and lease issues in MGV, but felt that transferring land to Parks for a community garden was viable, but would take time while they sorted out ownership. Upon learning of the whole scope of the project, they were interested in the idea but did not comment much on the vision as a whole.

met with Parks and Recreation, the idea of a community garden along the pathway was exciting and seemed like a simple process. However, when we met with Property Management, we learned about the technical challenges in obtaining land such as lease agreements and competing interests.

Wrapping Up

The proposal writing process involved balancing the many factors we learned about over the seven weeks onsite, including land ownership complications, community needs, the City of Cape Town's expectations, and our advisors' suggestions. We worked on integrating agriculture into the pathway through community gardening and tourism initiatives that could create jobs, such as walking tours. The vision also includes integrating MGV and Oude Molen's community assets by creating a feature based plan.

Some of the biggest challenges came from working with multiple stakeholders and reflecting their vision, along with our vision, in the plan. The Environmental and Heritage Management Department was interested in making MGV a heritage site and wanted heritage to be the proposal's main theme. We were concerned, at first, because our preparatory work was based on agriculture and tourism. We found, however, that MGV's heritage is rooted in agriculture which can serve as an attraction for potential tourists. We also had to be sensitive to other community initiatives. MGV's Green Light Project was initially interested in a plot of land for a help centre and community garden. Through city meetings, we found that another city department was looking into alternative uses for the land. In our proposal, we suggested compromises for the land to allow multiple uses.

The final product for our sponsor was a visually stimulating proposal that used images accompanied by text to walk a reader through the pathway experience. We also presented to multiple stakeholders as a final presentation. This represented our final vision for the pathway and will hopefully catalyse future action.

Final Recommendations

Highlight features through pathway development

A pathway through Maitland Garden Village and Oude Molen Eco Village would help make these communities destinations for walkers who could enjoy the views along the Black River, for those interested in social history and heritage, and for those who would like to see firsthand local community development initiatives. Our pathway vision
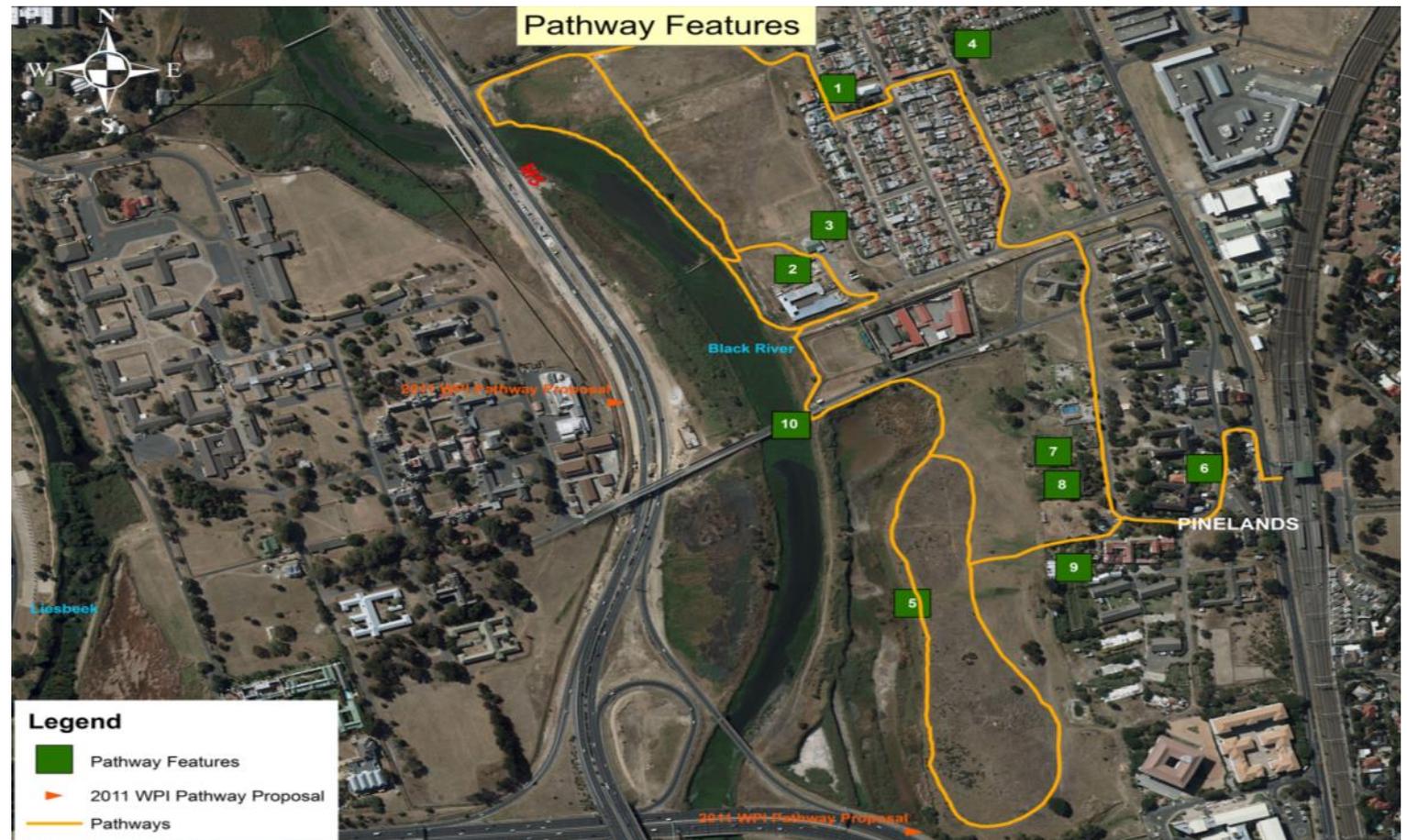

Figure 7: Map of pathway feature locations

highlights community and natural assets in both Maitland Garden Village and Oude Molen Eco Village. Features along the pathway include:

- Existing community gardens at the Methodist Church, crèche, and in residents' yards
- A community garden on the old driving range land
- A playground
- Delville Square
- Wetlands
- Oude Molen's Micro-Businesses
- Food Garden Village
- Horse stables
- Millstone Café
- Valkenberg Bridge

There are features along the pathway that will need minimal renovation with the creation of the pathway, such as the existing community gardens, Delville Square, the wetlands, Oude Molen's micro-businesses, Food Garden Village, the horse stables, and the Millstone Café. Interpretive signage could be added to all of these features to further incorporate them into our vision. Recommendations for community garden expansion, the playground, and the Valkenberg Bridge are given in subsequent recommendations.

Improve communication among stakeholders

We facilitated meetings between community members, city departments, and the Two Rivers Urban Park (TRUP) Committee, which we recommend to continue after our departure. Regular meetings between stakeholders regarding the pathway will help ensure that interested parties are notified and involved in planning processes. Attendees to such meetings should include community representatives from both MGV and Oude Molen, members of the TRUP Committee, the ward councilor for MGV and Oude Molen, and representatives from relevant city departments. MGV has also gained representation on the TRUP committee and it is imperative that their representation continues to keep the community voice active in future decisions. An example of this is the lack of a pedestrian bridge across the M5, an issue that was brought to the TRUP committee through this project.

Promote pedestrian access to connect Two Rivers Urban Park

Pedestrian access over the M5 and Black River is necessary for connecting TRUP and providing accessible transportation for MGV and Oude Molen residents. The Valkenberg Bridge is the best potential solution because it does not require additional funding or construction. Pedestrians should be allowed access past the first boom of the bridge, which ensures that they will not enter the hospital grounds or disrupt patients.

Develop a multipurpose area that allows the implementation of community supported agriculture

Figure 8: Valkenberg Bridge over the Black River

Based on multiple agricultural business models we evaluated, a community supported agriculture (CSA) model is a feasible option for MGV. This would entail a combination of working and paying members so that interested participants could buy into regular shares of produce either through providing labour (known as a work-share) or paying. CSA would allow community members to begin, and ultimately sustain, a small-scale garden that could expand as the amount of land and produce increases. While initial gardening stages would provide produce to the gardeners, there is potential for expansion of CSA membership to residents beyond the programme and for the creation of a farmers market, allowing further income generation.

The land included in the driving range lease would provide a suitable location for the beginning of a community garden. The garden will start in a small plot of land and grow in phases as more land is needed. This land could be shared with other MGV community groups to accommodate multiple visions and benefits. The driving range building space could also be divided for offices and storage. A playground near the community garden patch would allow parents to work in the garden and provide a safe play space for children.

Initiate Black River walking tours

Guided walking tours, which could generate a supplementary income for guides via admission fees or gratuities, provide opportunities for job creation. These tours along the pathway will visit

Figure 9: Phases for MGV's community garden

Figure 10: Sample walking tour brochure

highlighted features while discussing their heritage significance. Interpretive signage throughout the pathway will enhance these tours by visually bringing the tour together. The Green Light Project is interested in guiding these tours. Bringing walking tours through MGV and Oude Molen will help to make them a destination.

Reflection

Shared action learning, the guiding philosophy we used for collaborating with community members, city officials, our project advisors, and the TRUP Committee, was not only useful for creating visions for the pathway, but also facilitating communication between stakeholders in the pathway. Liaising between stakeholders that previously lacked communication provided a challenge for our team because we were new to this project, the MGV community, and municipal government. As a team, it was difficult to express our concerns and opinions among the other stakeholders because we felt that they often knew more about community and government issues.

Even within the MGV community, communication difficulties led to duplicated, unsupported, and disjointed visions for the driving range. These ideas include a help centre, soccer field, and community garden. If WPI became equally involved with other leadership organisations within MGV, we perhaps could

Figure 11: Wetlands behind Oude Molen

have mediated between these organisations instead of advocating for one group over the other.

We also learned continually about city government relationships with both local government and provincial government. As we attended various presentations and meetings with the city, we realised that we were inexperienced with the government structure and political dynamic; however, we found that learning about these things was an interesting and valuable educational experience. When it was time to put the pathway vision into a formal proposal, we were unsure how to balance appro-

priate text with captivating visuals. For our final proposal, we were able to respectfully create a pathway vision for different organisations to read and sell the pathway idea.

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Acknowledgements

Rooftop Gardens for Sustainable Livelihoods in Cape Town

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

Abstract

High rates of unemployment afflict Cape Town, especially in the informal settlements surrounding the city. This project developed a rooftop gardening programme to create employment opportunities for unemployed and poor Cape Town residents. The rooftop gardening programme can promote job creation, entrepreneurship, and local food production, and if implemented at a large scale, could have a positive impact on dozens of low income households in Cape Town. Through GIS mapping, market research, and cost and revenue calculations, we have developed a programme to implement rooftop gardens in the Central Business District of Cape Town.

This project summary is part of an ongoing research programme by students and faculty of the WPI Cape Town Project Centre to explore and develop with local partners options for sustainable community development in South Africa.

For our full project report: http://wp.wpi.edu/capetown/homepage/projects/p2012/rooftop

For more about the Cape Town Project Centre: http://wp.wpi.edu/capetown/

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The City of Cape Town's Office of Sustainable Livelihoods

Touching the Earth Lightly (TEL)

Problem Statement

Unemployment is a major issue in South Africa, rooted deep in the country's history. At the end of apartheid in 1994, over a third of the labour force was unemployed. High unemployment rates are partly due to rapid industrialization and urbanization in the mid-1970s, which caused a population shift to urban areas in search of opportunities that did not exist in the rural areas. High unemployment rates also stem from the social and economic structure of the country under apartheid. Businesses were given tax breaks on capital investments that adopted labour-saving practices. Instead of employing large numbers of unskilled workers at low wages, smaller numbers of skilled workers were hired at higher wages (Nattrass, 2004). The opportunities that so many had come to the cities to find were few and far between. Recent surveys show that there are continuing high levels of unemployment and that the current economy of Cape Town favours skilled labour positions over unskilled positions, such as gardening (City, 2009).

A study done by Kingdon and Knight looked at unemployment rates among different groups showing that certain groups are more likely to enter into and remain unemployed than others. Their data showed that 41.2% of Africans were unemployed, compared to only 6.3% of whites. 38.7% of people with no formal education were unemployed, compared to 5.7% of people with higher than secondary level educations. This suggests that although employment opportunities may be available, many of the unemployed don't have the education or skills to fill the positions (Kingdon, 2005). According to a recent report, 74.7% of individuals in a Cape Town informal settlement, The Graveyard Pond, have not been able to find full-time jobs (Drivdal, 2011).

With high rates of unemployment and poverty in Cape Town, the City government has emphasised creating sustainable livelihoods for the disadvantaged. The City's Office of Sustainable Livelihoods has led this programme, which aligns with their mission to create jobs for the unemployed while stimulating the local economy and promoting environmentally friendly practices. Local gardeners grow high market value produce on rooftops in the Central Business District (CBD), creating jobs and developing entrepreneurship.

Mission Statement and Objectives

The goal of this project was to stimulate discussion and reflection among stakeholders regarding the feasibility of creating jobs through growing high value produce on rooftops and selling the produce to local restaurants. To achieve this goal, the following six objectives were created:

1. Outline the management and staffing of the programme.
2. Determine what plants will be grown and how they will be produced.
3. Determine the start-up costs, recurring costs, and projected revenue of the pilot garden and entire programme.
4. Develop a proposal to implement a pilot rooftop garden.
5. Investigate market interest in the programme.
6. Find sites for the rooftop gardens within the CBD.

On the Ground in the Sky

Stephen Lamb, the founder of Touching the Earth Lightly (TEL), was appointed to construct a rooftop garden on the 44 Wale

Figure 1: Our area of study, the Cape Town city bowl

Figure 2: Street level view of the 44 Wale Street rooftop garden

Street government building. We had anticipated that this garden would be a source for concrete data, such as production levels and effects of uncontrollable variables. Once we were on the ground in Cape Town, we realised that the project was not as far along as we had thought. This rooftop garden was meant to be a showcase, rather than a test bed for micro greens and oyster mushrooms.

Our sponsors' goal for the project was to contribute to the improvement of the quality of life for the poor in Cape Town while promoting resource efficiency. They were looking for us to provide them with hard statistical data they were lacking, such as how much rooftop space is available in the CBD and the economic viability of the project.

After initial meetings with our sponsors, our reflections left us with some major questions regarding the feasibility and sustainability of the programme.

- Since job creation is the purpose for the programme: How much rooftop gardening space and associated revenues from food production do you need to sustain one job? Where can we find workers and how will they be selected? How will the workers be trained?
- In regards to the management hierarchy of the programme: What positions are required for a sustainable programme? Who will supervise the workers? Who will manage the gardens once they are operational? What scale must the programme be started at to ensure the hierarchy can be sustained?
- From a financial standpoint: How much money is required to start-up the programme? How long will it be until the gardens generate revenue? Will this revenue be enough to cover costs? Can revenues support the expansion of the programme?

Key Accomplishments

We developed the basic structure and rationale for a rooftop gardening programme. Our key accomplishments are:

1. Developed a framework for a sustainable multi-rooftop gardening programme
2. Developed revenue projections that suggest the programme could sustain jobs
3. Assessed market interest in the programme and produce
4. Identified potential rooftop gardening space
5. Stimulated discussion within city agencies and among key constituents
6. Generated interest among city agencies to fund a pilot garden on city property
7. Created a set of proposals to explain and market the programme

Programme Framework

Stephen Lamb developed the idea to use unutilised space on rooftops in the CBD as venues for the production of oyster mushrooms and micro greens in order to create much needed jobs. Our team had the opportunity to transform this innovative idea into a feasible programme.

Valuable input from our sponsors was taken and developed into a framework for a sustainable multi-rooftop gardening programme. Multiple rooftop gardens are necessary for the start-up since one rooftop

Figure 3: Front cover of programme proposal

garden would not be able to support garden maintenance, worker training, and the incomes of its supervisor and gardeners. We established that the start-up rooftop gardening programme should be 1000m^2 of rooftop garden space tended by 10 full-time or 20 part-time gardeners, managed by one supervisor, and overseen by TEL. We developed a detailed proposal to find corporate funding for the programme. We also created a second proposal for a pilot rooftop

Table 1: Cost Capital and recurring cost

Capital Costs	
Cost Factors	**Price (Rand)**
Decking	500 000
Bolts and Fixings	291 667
Crates	62 500
Plants	13 858
Soils	55 491
Mushroom Cabinets	267 000
Construction Labour	148 692
Total	**1 339 208**
Recurring Costs	
Cost Factors	**Annual Projection (Rand)**
Training	100 000
Maintenance	150 000
Water	100 000
Seeds and Plants	110 000
Mushroom Growing Medium	7 700
Salaries for Gardeners and Supervisor	419 000
Total (1 Year)	**886 700**
Total (2 Years)	**1 773 400**
Total Start-up Costs	**3 112 608**

which will be used to generate concrete data, establish appropriate gardener training, and determine efficient gardening techniques.

Monetary Inputs and Outputs

Cost

Projecting the cost and revenue of the programme was crucial for the development of our proposal to both corporate funders and to city agencies. Our sponsors provided us with a cost breakdown for the rooftop garden at 44 Wale Street to supplement our research, which helped us to identify the necessary cost factors.

Once we refined the start-up cost, we determined the annual recurring cost, including salaries for two years and costs for training, maintenance, water, and seeds. In our proposal, we asked for funding to cover the recurring costs for the first two years, after which it is anticipated that the programme will generate enough revenue to pay the workers and cover its recurring costs.

Determining the start-up and recurring costs allowed the team to estimate the funding needed for the entire rooftop programme and a pilot rooftop garden on the Prestwich Memorial building. Initially, these costs were high and represented an ideal rooftop garden setup. Our sponsor saw the expense of the ideal rooftop and requested

Table 2: Revenue for the 1000 m^2 rooftop garden programme

Returns on Investment	Growing Space (m^2)	Production levels (kg/yr)	Price per (Rand/kg)	Total Revenue (Rand/yr)	30% Revenue (Rand/yr)
Oyster Mushrooms	125	24 750	60	1 485 000	445 500
Alfalfa Sprouts	75	5 675	65	368 843	110 653
Mung Bean	75	5 675	60	340 470	102 141
Brussel Sprout	75	5 675	29	162 291	48 687
Baby Butter Lettuce Sprouts	75	5 675	85	482 333	144 700
Baby Spinach	75	5 675	48	780 244	234 073
Total Revenue				**3 619 181**	**1 085 754**

pricing for a less expensive pilot garden. We were able to significantly cut down our costs to make the rooftop programme and pilot garden feasible by finding cheaper ways to produce oyster mushrooms and taking out items like lattices that did not affect production.

Revenue

At the beginning of the project, our sponsor stipulated that the rooftop gardens would grow oyster mushrooms, alfalfa sprouts,

mung bean sprouts, and brussel sprout micro greens. In order to calculate revenues, we researched the likely production levels and local wholesale prices. We had trouble finding these figures for the micro greens, so our sponsor suggested we extrapolate based on data of mung bean sprouts we could find at the grocery store. Based on this method, the estimated revenue numbers were extraordinarily high; according to our advisors, our revenues were overestimated by a factor of ten. We found a web-

Table 3: Supervisor and gardeners' incomes

First Two Years Income (Salary Based)		After First Two Years (Percentage of Profit)		
Position	**Salary (Rand)**	**Position**	**% Profit Allotted**	**Yearly Income (Rand)**
10 Full-Time Gardening Positions	263,000	**10 Full-Time Gardening Positions**	45	286,089
1 Supervisor	156,000	**1 Supervisor**	25	158,939

site which specialized in micro green production and gave production levels for micro greens based on weight and planting practices. Using these guidelines, we were able to generate more accurate revenue numbers. Since our calculations did not take into account several uncertainties, such as Cape Town's strong winds and hot summers, plant disease, variable germination rates, and the learning curve for the gardeners, we reduced our projected production volumes to 30% of the calculated value.

Income

As part of the programme, we anticipate that for the first two years, the gardeners and supervisor will be paid a salary provided by the funding and the service provider will be paid based on profit. We plan for the gardeners to make the Cape Town minimum wage of R8.95 per hour and for the supervisor to make the average Cape Town salary for a manager in sales, which is R13 000 per month (Minimum, 2012; Salary, 2012). Salaries for two years at these rates have been incorporated into the funding request. 90% of any generated revenue during the first two years will go into the programme reserve and the remaining 10% will go to TEL.

After the first two years, the rooftop gardens should be sustainable and the

Figure 4: Restaurant trifold pamphlet

income of the gardeners and supervisor will be profit based, both of which need to be incorporated into the profit breakdown. To establish the profit breakdown, we first calculated 30% of our revenue that was projected assuming a perfect harvest which accounts for complications such as gardening mistakes, spoilage, plant disease, and weather damage. The adjusted revenue this generates is R1 085 754 ($125 317). We subtracted the projected maintenance cost of R450 000, leaving a profit of R635 754 ($73 378) . We determined

that to match the incomes the workers received during the first two years, 45% of the adjusted profit will be divided amongst the gardeners and 25% will go to the supervisor. TEL will get 10% of the profit leaving 20% for the reserve. Table 3 shows the comparison of the incomes of the gardeners and supervisor for the first two years and for the years to follow. The incomes are nearly identical which will provide a smooth transition when incomes switch from salary to profit based.

Market Investigation

In order for the rooftop gardening programme to be sustainable, an adequate market must be established. We generated a list of 99 restaurants in the CBD with addresses and contact information. Of these 99, we interviewed 11 to assess interest in the programme and found 5 restaurants that would be willing to purchase the

rooftop garden produce.

Through our interviews, we discovered crucial marketing strategies and ideas. During the start-up phase, the programme should market produce to small-scale, independent, and high-end restaurants. These restaurants require the type of high quality produce the programme is looking to grow at quantities matching projected production levels. We found that many restaurants require small quantities of a large variety of micro greens. Anticipating that there might not be sufficient demand for the produce, we decided to also produce baby butter lettuce and baby spinach, both of which are easily marketable. We developed an informational pamphlet (Figure 4) to be handed out to restaurants which can be found on the team's website.

The Farm in the City

To address the question about potential rooftop garden venues, we used GIS mapping and Google Maps to determine all of

Figure 5: Available rooftop space in the Central Business District

Figure 6: Team at presentation

the flat rooftop space in the CBD, allowing us to calculate the large scale potential for the programme. With Photoshop, we created images to highlight each available rooftop (Figure 5) and the congregate available space they formed. The team calculated that in the CBD there is approximately 162,000 m^2 of available rooftop space that could be utilised for gardening. We created a database with addresses of many of these buildings with their contact information which will be used by the City and TEL when moving forward with this project.

Raising Awareness

An important aspect of our project was to develop a strategy to best represent the programme and market it to stakeholders. Over the course of our time in Cape Town, we had three presentations to city agencies and key constituents.

Sustainable Livelihoods Network

We presented our programme during the Sustainable Livelihoods Network Meeting on November 1, 2012. Still in the early stages of the project, our primary goal was to inform the department of the project mission. The key discussion topics of our presentation were the overall goals of the project, the major stakeholders, the job opportunities, and our plans for moving forward. After the presentation, the main concerns raised by attendees surrounded the workers: who they would be and where we would find them. They suggested that we hire workers who have already worked on governmental work projects which will allow the City to better assess their work ethic and dependability. They suggested we look into Voortrekker Corridor, a mayoral urban regeneration programme, and Straawerk, a Christian mission group. As a result, we included Voortrekker as a way to find employees in our proposal, but not Straawerk since this group is not focused specifically on finding jobs for the poor.

Department of Economic and Human Development

We made a presentation to the managers of the Department of Economic and Human Development on November 26, 2012. In this presentation, we discussed our proposed programme, the pilot rooftop garden, and projected costs and revenues. The meeting attendees asked us more difficult and specific questions than the ones raised during our previous presentation. Once again it was stressed that we need to find dependable workers, and it was suggested that we strongly consider workers who have already been involved in governmental work programmes. In our proposal, the salaries for our workers were revenue based but it was advised that we include a stipend for workers, which is now included for the gardeners and supervisor. One sceptical attendee asked us why we were planning to grow produce on a rooftop instead of spaces more conducive to production. We explained that this programme utilizes dead space in the city and is meant to create jobs, not necessarily optimise production The response to this presentation was generally positive and led to negotiations for R200 000 ($23 084)in funding for the pilot garden.

Cape Town Design 2014

For our final presentation, we presented to city, Cape Town Design 2014, and World Design Capital representatives on December 13, 2012. The discussion topics of this presentation were similar to the last; we presented a complete programme plan and

Figure 7: Cape Town Design 2014 button

Figure 8: Measuring and sketching designs for Prestwich Memorial with Stephen Lamb

ed in the World Design Capital project showcase, it will be projected into an international light, giving the programme the support and recognition it needs to expand.

Laying the Foundation

When we discussed the need for a pilot garden with our sponsors, they recommended we consider using the Prestwich Memorial building. The building was an attractive option because it is managed by a Cape Town city official, was originally constructed to support a rooftop garden, has water and electrical access, and is waterproof. We

discussed this possibility with the building manager who asked us to draft designs for the space.

The original design for the pilot garden included two production areas, a memorial area, an oyster mushroom substrate inoculation space, and a washing and packaging station. . Since our original design cost more than was likely to be available, we simplified the design so that funding was requested for only one of the production spaces. The washing and packaging station was incorporated into this section, and the substrate
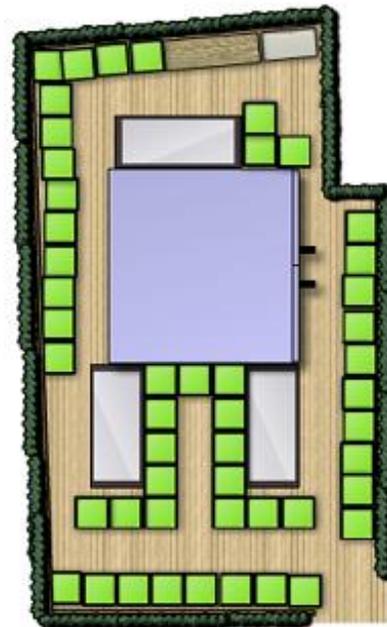
conveyed the importance of experimentation through a pilot garden. Our presentation was well received by attendees and triggered positive discussion. Some suggestions for advancing the project were to:

- Approach building owners and corporations that value social and economic development and support green initiatives.

- Present carbon footprint reduction as a selling point.

- Consider selling the produce at a premium to allow some of the produce to be donated.

- Consider selling the produce to building occupants at retail price.

- When the programme expands, look into selling to large corporations such as Woolworths.

- Incorporate a relaxation space for building occupants and possibly for the

public.

- Allow public access to some rooftop gardens for educational purposes.

- Look into supplemental funding through social media sites like Crowdfunding.

Most of these suggestions were previously brought up and considered by our team. Due to time constraints, we were unable to explore all of them but encourage the City and TEL to do so. If the Prestwich Memorial pilot garden (Figures 9 and 10) is implemented, the City and TEL could apply to be a Cape Town Design 2014 project.

We consider our opportunity to present to the Cape Town Design 2014 board a significant step in helping to promote the programme. Consideration as a Cape Town Design or World Design project had been an ambitious goal of ours since the preparation phase of this project. If our project is includ-

Figure 9: Two dimensional view of pilot

Figure 10: Three dimensional view of pilot garden

Key

Figure 11: Project team with sponsors Cindy Jacobs and Stephen Lamb

inoculation area was moved to another section of the roof. Figures 9 and 10 show our design for the pilot rooftop garden, with a projected cost of roughly R200 000. This proposal has been submitted to the City, and a decision to fund the project is forthcoming. If this project is funded and becomes operational, concrete data will be recorded and allow for a more compelling proposal to gain funding for the 1000 m^2 start-up rooftop gardening programme.

Reflection

When reflecting on our experiences in Cape Town, we value the relationships we developed and are proud of our accomplishments.

Sponsor Relationship

Our relationship with our sponsors gave us a first-hand view of the relationship between bureaucracy and a social entrepreneur. As an entrepreneur, Stephen Lamb was excited by the innovation of this project and valued marketing the programme to excite potential stakeholders. He wanted to see his visionary idea fruit into a practical job opportunity. While also interested in the implementation of the programme, the City carefully considered the legality and logistics surrounding the programme. While working towards the same goal, occasionally their differences were highlighted. As students implementing this programme, we tried to understand and address the needs of both of our sponsors while focusing on what was in the best interest of the implementation of the programme.

Positive Outcomes

This project focused on creating sustainable livelihoods through the design of a rooftop gardening programme in the CBD. The programme we have proposed could provide a source of employment for ten full-time low income individuals. We expect that once operational, the gardens will generate enough revenue to support all employees, maintain the gardens, and eventually expand the programme to include more rooftop gardens.

We created four proposals during our term in Cape Town showing how the big vision of the rooftop gardening programme can be implemented. All of our proposals can be found on our website:

- A proposal to be given to corporations to request funding for the 1000 m^2 rooftop garden programme

- A proposal seeking funding for a pilot garden on the Prestwich Memorial building

- A proposal seeking funding for a pilot garden on the same building within a R200 000 budget

- A proposal submitting our designs for the Prestwich Memorial garden to the building manager

We are confident that the City and TEL will be able to implement the programme using the proposals and marketing materials we provided. Figure 12 outlines the steps that the team recommends be taken by TEL in regards to the pilot rooftop garden with oversight from the City.
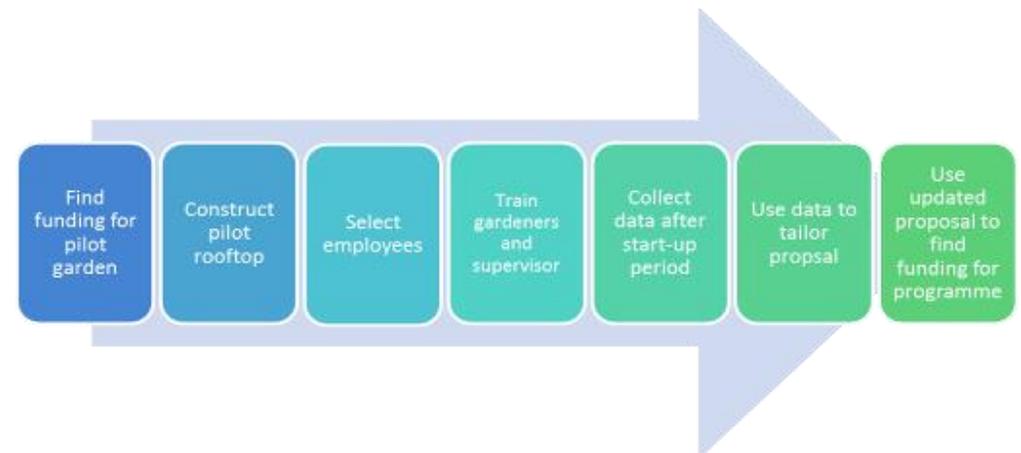

Figure 12: Progression of events that need to occur for the continuation of the programme

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