CHAPTER

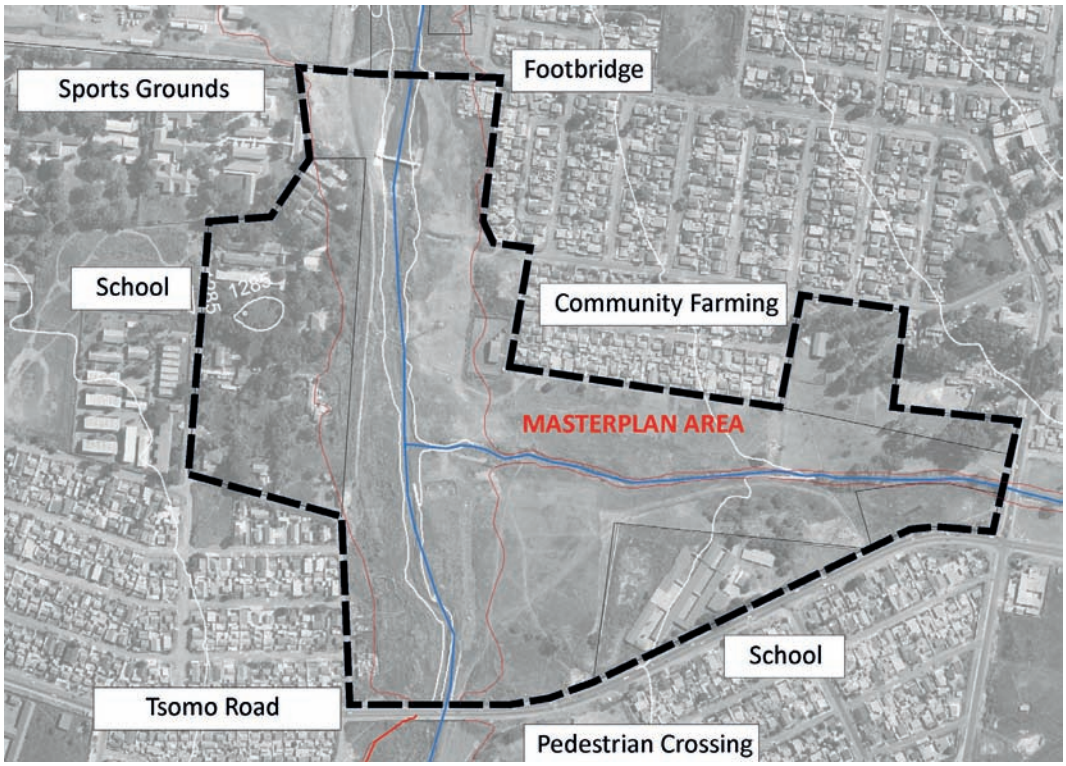
7

DESIGN DEVELOPMENT

7.1. INTRODUCTION

For the development of the masterplan, this chapter will be focusing on the area north of Tsomo Road which will encopass the focus project site (Figure 70). Based on the analysis and frameworks for the Pienaar's River, this chapter aims to employ the recommendations to reclaim the river in the Masterplan area that will also encompass the focus design project. The chapter first introduces and explores the concept development of a Masterplan for the site. The chapter then breaks down the master plan into elements and layers that explain how the different proposed systems fit into the existing natural and built environment. The chapter then concludes by summing up what was explored here and how the proposed Masterplan informs the selection of the Sketch plan area.

Figure 70: Masterplan area (Author, 2011)



7.2. CONCEPT

The concept is based on the notion of *community meaningful-places* where people are attracted and pulled to a shared meeting space to interact with each other and the environment thereby bringing the place to life. These places encourage activities that involve the community, where they can associate and freely connect with one another and the environment. According to Roe (in Benson & Roe, 2007: 80), where communities are helped to take decisions and power over the change in their environment, it may act as a catalyst to help create new connections within communities, release the energy and develop the potentials, which can alter economic as well as social conditions. The author submits that the proposals for this site should only involve the community at planning and design stage but also in the daily operation of the structures and spaces. The user should be allowed to change and re-appropriate these for themselves whenever necessary.

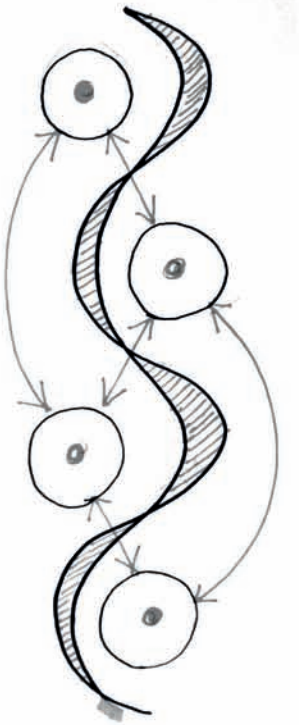


Figure 71: Parti diagram (Author, 2011)

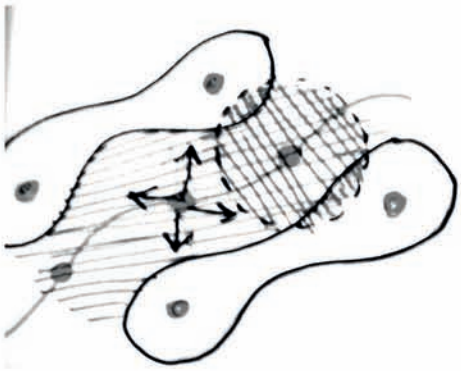


Figure 72: Parti diagram, open space linkage across the river (Author, 2011)

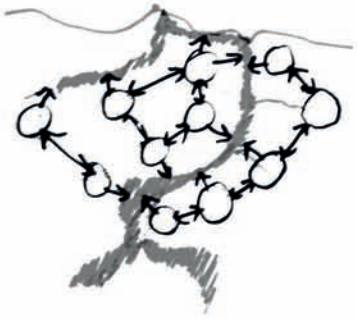


Figure 73: Parti diagram, open space network (Author, 2011)

7.2.1. *Parti*

The concept diagrams grow from the vision for Pienaar's River as a continuous spine that can activate the river edge. The spine (Figure 71) is made up of different components linked and supporting each other starting with the proposed pilot project and the existing projects along the greenway. The diagram (Figure 72) shows the pilot project as the heart that pumps life blood through the green system connecting to other smaller active nodes along the river and together acting as a sustainable system. The pilot project will be the first centre of energy pulling the residents to the river. The author envision that with the introduction of more projects linked by the river system and extending into the township, a new network (Figure 73) of community open spaces will develop.

7.2.2. Concept sketches

The initial concept drawings (below) presented different approaches dealing with the constraints and opportunities the site presents. They present different options that form part of the planning and design process:

A central meeting place

The first idea was based on the idea of a central gathering place (Figure 74) for the community surrounding the site that will act as the main attraction to the area. Learning from the Tswana's Kgotla spatial system, the central space becomes the most important area for meetings and interaction. The concept then connects to a nearby school which would form the *lekgotla* facing the community and housing the administration and maintenance for the park. The school becomes integrated with the open space linked by a strong axis (Figure 75) from the other side of the river and as a result becomes part of the larger community. The central meeting place needed to be revised as it did not respond well to the study area being the river system. It does not solve a lot of the problems of safety, bridging and neglect as highlighted in the site analysis process.

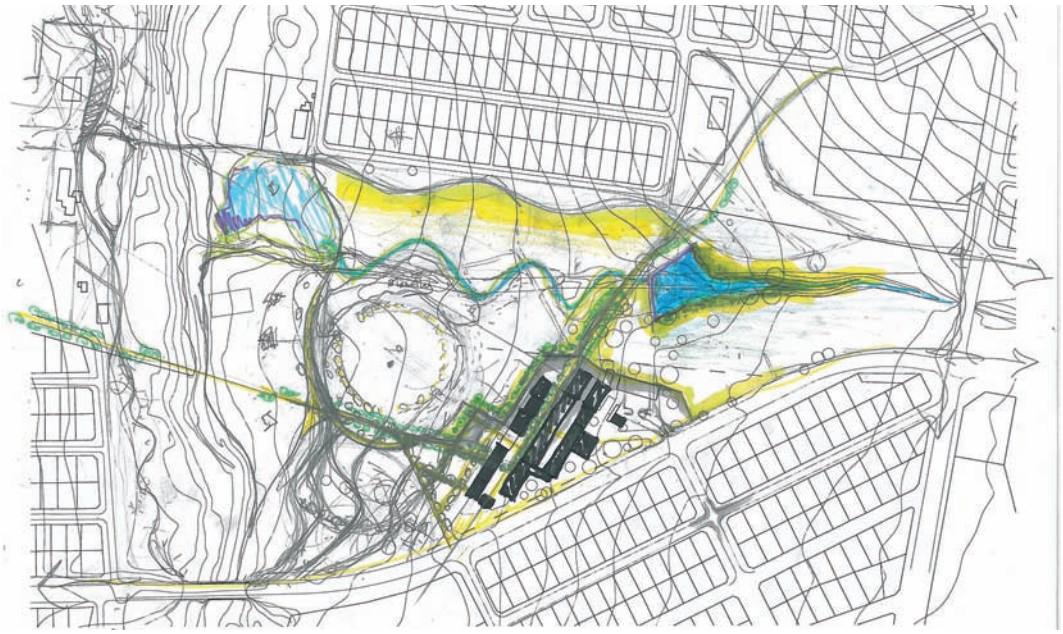


Figure 74: A central meeting place concept 1 (Author, 2011)

Figure 75: A central meeting place concept 2 (Author, 2011)

Back to the river

This plan (Figure 76) breaks down the first concept drawing into smaller areas that respond to the community activities happening on the edges while at the same time paying more attention to the river and the possibilities that can benefit the community by better integrating the water systems into the planning.

Whilst still using the school as a community facility, the large central meeting place is replaced by a large dam that gets water from the river upstream, stormwater and roof water from the school. One important community activity introduced here is the gardens that take advantage of the large unmanaged open spaces to be used as productive landscapes. The school would become the buyer for any excess from the gardens while it also becomes a teaching facility on urban agriculture.

This plan was criticised mainly on the reasoning behind incorporating the school into the masterplan. It raised questions in terms of the functioning of the school and the envisioned interaction with the open space and community in the process unnecessarily taking the attention away from the main issue of the study which is the river edge revitalisation.

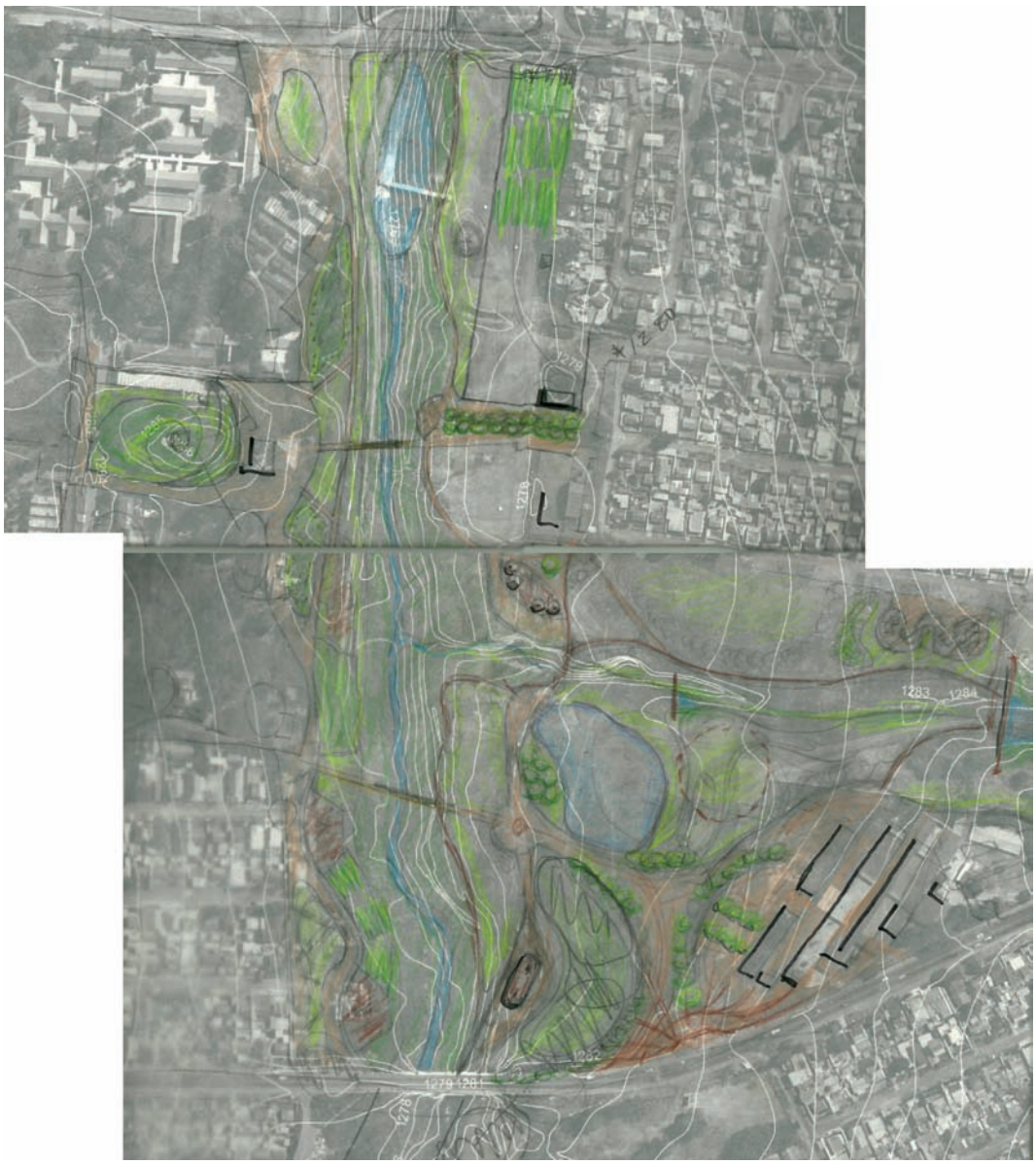


Figure 76: Back to the river (Author, 2011)

Green spine as an activity corridor

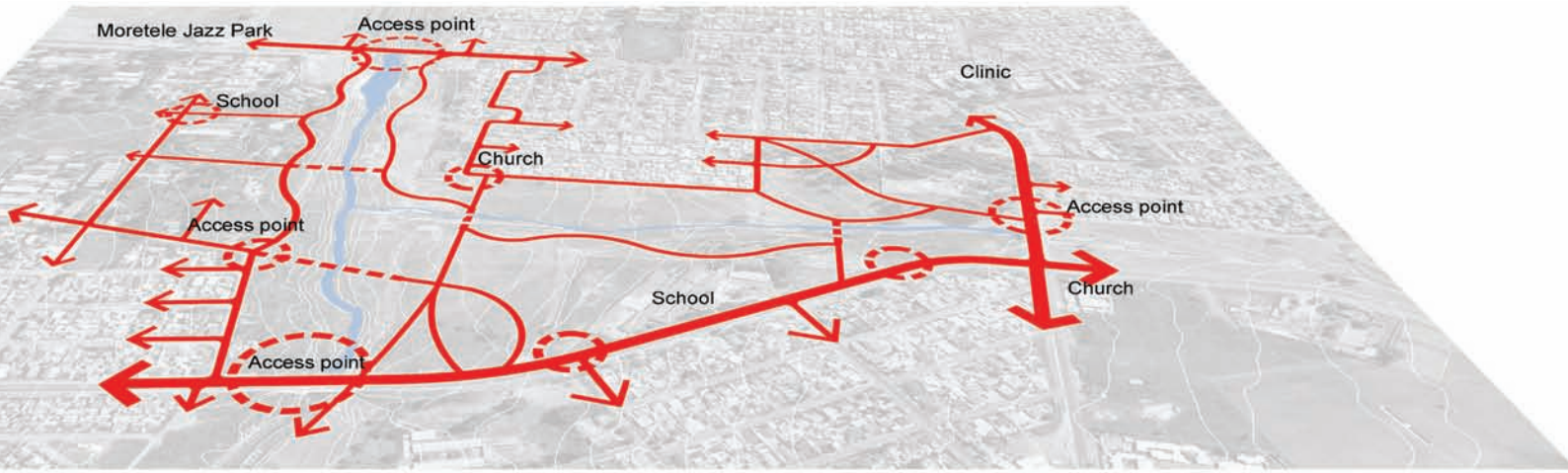
The final conceptual plan (Figure77) focuses on the river as the main problem in this study and looks at incorporating building that can be better motivated or defended. It also boldly expresses the scale that the urban farming can take and looks at how it would work with the existing circulation system. While keeping most of the ideas from the first two conceptual plans, it then explores the feasibility of reusing the building from an abandoned school as a community centre that will better respond to the river as well as some of the community issues like education, crafts and the farming. These activities will bring masses of people to the area. Surveillance towers are provided along the river to make it a safer place. The plan proposes a boulevard along the busy western side of the river that will link the people to the river. It also proposes parking areas to cater for the people coming to the markets at the gardens and the amphitheatre hosting entertainment activities for the community. The author submits that this plan responds better to the problem statement and main concept hence it is taken forward and developed in the final masterplan for the pilot project.

Figure 77: Green spine as an activity corridor (Author, 2011)


PROPOSED BRIDGE
ARRIVAL PLAZA
INFORMAL MARKET
GREYWATER TREATMENT WETLAND
SEWERAGE PIPE
AGRICULTURAL CENTRE
PICNIC
PIENAARS RIVER
URBAN AGRICULTURE
SCHOOL
COMMONS AREA
BRAAI FACILITIES
LOOKOUT PARK
COMMUNITY CENTRE
RESTAURANT
RETENTION POND
CHURCH
PEDESTRIAN BRIDGE
MARKET
WETLAND
URBAN AGRICULTURE
MANURE PRODUCTION
HUT
URBAN AGRICULTURE
RETENTION POND
MAMELODI WEST
RETENTION POND
PIENAARS RIVER
AMPHITHEATRE
PARKING
KIOSK
SPAZA
EXISTING BRIDGE

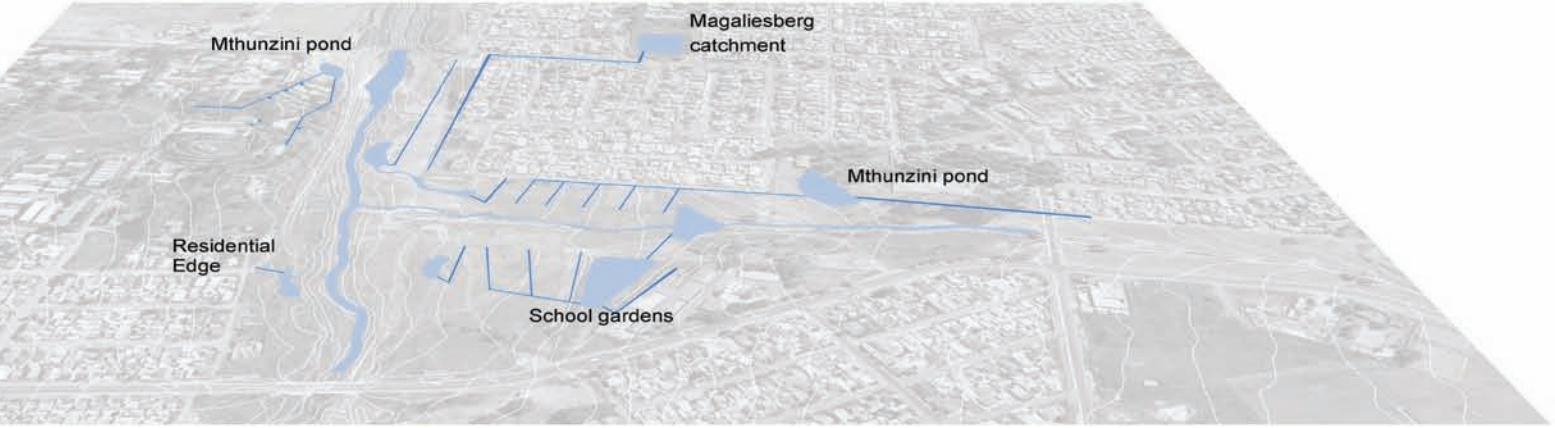
Figure 78: Pienaar's River Park Masterplan (Author, 2011)

Figure 79: Pienaar's River Park Systems (Author, 2011)


Moretele Jazz Park
Access point
School
Church
Clinic
Access point
Access point
School
Church
Access point


Agricultural &
Community centre
Urban
agriculture
Urban
agriculture
Beer hall
Waste transfer
station
Urban
agriculture
Stalls
Screen


COMMONS AREA
PICNIC AREA
RIVER TERRACES
KHALAMBAZO LOCAL PARK
LOOKOUT PARK
THE CHURCH
MNTHUNZINI LOCAL PARK
LESAKENG
KICKABAOUT LAWN
D6 LOCAL PARK
AMPHITHEATRE


Mthunzini pond
Magaliesberg
catchment
Mthunzini pond
Residential
Edge
School gardens

7.3. MASTERPLAN AND PARK SYSTEMS

The masterplan provides places for pleasurable and sometimes accidental meetings and gathering. It also celebrates the attachment that people generally have to rivers by providing places that allow them to act on activities they associate the river with especially in a community that has an agricultural background. These interactions between people lead to more time spent together connecting as a community in safe, well lit multi-functional green open spaces. It also proposes pedestrian pathways that ensure connectivity and linkage both within the park and to neighbouring activity centres. Abandoned and decaying buildings that are restored and reused as community activity nodes. In line with the analysis done, the author will pay attention to the following systems (Figure 79) and elements of the park:

7.3.1. Open Space System

The open spaces (Figure 81) will be developed as part of a regional linear park along the river system. The spaces are cleaned removing rubble, bottles and litter to make them healthy people spaces. Soft lawn and lighting is provided where necessary to make the spaces comfortable and accessible in the process encouraging circulation. The site has three main areas with concentrated vegetation: pines, biodiversity hotspot and old educational precinct west of the river. All existing native trees will be either retained or relocated on site for micro climatic control and space making. Water plants will also be used for water treatment and to capture silt in the wetlands system.

Culturally or historically important exotic trees will be kept for their value in creating a sense of place (e.g. pine trees at Mthunzini Park and Jakaranda trees at the educational precinct) while insignificant alien invasive vegetation will be removed. The biodiversity hotspot should be protected and used for educational purpose by the local schools. Proposed new planting is to be mainly indigenous (including in wetland and gardens) using species found on site listed in the site analysis or those native to Magaliesberg Mountains and the Pienaar's River system. The rehabilitation planting palette should also follow the Pienaar's River catchment rehabilitation guidelines.

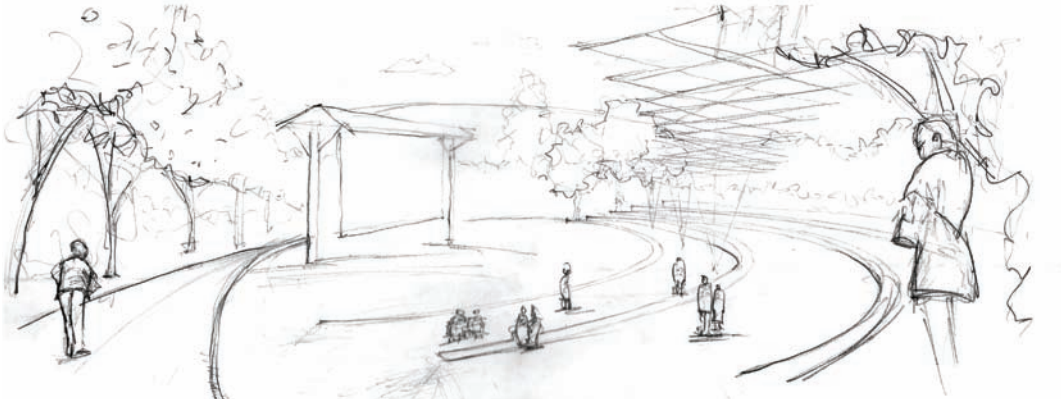


Figure 80: Conceptual amphitheater (Author, 2011)

Figure 81: Open Spaces (Author, 2011)

It is also advised that medicinal plants used by the users be included in the palette. Involving the community in plant selection and planting is very important to instil a sense of ownership. The amphitheatre (Figure 80) acts as the meeting place for entertainment and community activities. The amphitheatre will host outdoor concerts and motion picture for the locals. It will also double as kick about area.

7.3.2. Community nodes

The interactive programs provided educate and celebrate places that will bind the community together (Figure 83). These spaces and structures are adapted to people's needs to allow community activities that encourage meaningful interaction. The meeting and gatherings of people in these smaller parts of the large park and greenway system forms positive and functionally supportive spaces in the area (Figure 82). These elements contribute to the well being and

Figure 82: Sheltered seating (Author, 2011)

health of the people while strengthening their shared identity as a community. The shared values that the community attaches to these places will revitalise a sense of place in the area. The group activities performed here support a spirit of togetherness and active participation in community life. Because the design takes into consideration the historical and cultural significance of these spaces, they are given contextual meaning that makes them relevant and understandable by the users. These include:

Riverine edge - Needs to be developed in a way that will benefit the river ecology and the community. The river is rehabilitated to accommodate different activities and make it safe for play and crossing.

Mthunzini Park(s) - The space needs a face lift and introduction of structures. This popular spot is redeveloped to better accommodate the activities currently taking place here including picnicking and braai. Play structures are also provided for the kids.

Markets - The markets will serve the agricultural community as well as the artists selling and exposing them to the locals and visitors. Visitors will be exposed to the other parts of the park. They will also interact and hopefully engage with the other spaces and the agricultural production processes. The markets will also be room for local artists and craftsman to sell their items and demonstrate their skills.

Community facilities hosts among others a centre for information, after school learning and events to take advantage of abandoned school. The old buildings are reprogrammed to integrate with the community while still keeping the education aspect. It will host a nursery school, after classes as well as computer facilities and training for the community.

Figure 83: Community nodes (Author, 2011)

Church (es) - One of the local churches is using the open space as an outdoor church and needs to be catered for in design. New seating and planting responds to the current use and tries to provide for a more comfortable experience. The space stays robust allowing for other uses during the week.

Towers - This will function as surveillance, orientation, water storage and lighting towers for the community. A series of these multifunctional structures are planted along the river system.

Lookout point – The masterplan takes advantage of a small knoll in the school area overlooking the site from the west to visually connect users to the site while at the same time providing them with quieter spaces for contemplation.

Waste transfer station - Minimize waste, pollution and environmental damage by temporarily holding sorted household waste before being taken away to recycling centres and also recycling organic waste from the gardens as compost.

As in Tswana spatial planning, the spaces celebrate the idea of living outside. The open spaces allow for a myriad of community activities to take place at different times of day ensuring surveillance and continued safety of public spaces but most importantly sustainability of community life.

Culture and identity in Urban Agriculture

Farming becomes a vital part of the whole scheme and the aims for sustainable development of the river and community while reclaiming a sense of place for the township (Figures 84-87). In Mamelodi, urban agriculture along Pienaar's River can also revitalize and building strong communities and sense of stewardship. It can also ensure local supply of vegetables, save on energy and money used in importing crops and creating employment.

Other benefits of urban agriculture include:

- Sustainability awareness and education - hands on learning experience.
- Free time activities for kids – helping their parents after school.
- Community development projects - associated with farming spring up.
- Surveillance improves safety – there will be somebody in farms for most part of the day.
- Fighting poverty by targeting the unemployed and poor.
- Fostering local food production thus reducing income leakages.
- Promoting food security and resilient local food systems.
- Providing a means to reduce waste streams through composting.
- Promoting social organisation (social capital) via cooperatives
- Effective use of land that currently is treated as waste and Improving the visual aesthetics of unused land.
- Enhancing ecosystem services provided by open spaces (clean air, reduced wind velocities, temperature control, groundwater retention, stormwater attenuation) (Siyakhana Initiative, 2010: 9- 12).

These benefits when taken together present urban agriculture as a sustainable community building activity. As infrastructure in a city or town, continuous urban agriculture has the potential of being a thread that is woven through a community creating a rigid and ecological backbone for growth connecting neighbourhoods, open spaces, and urban markets (Grimm, 2009: 2). The author strongly agrees with both Siyakhana and Grimm on the potential value of urban agriculture especially in a poor community like Mamelodi. Apart from the sustainability strategies associated with urban agriculture, the author sees this as an opportunity to revitalise the area and bring the locals to the river in the process of reclaiming the neglected spaces.

Figure 84: Farming as a community activity (Read, 2011)

Figure 85: Urban farming by a school (Author, 2011)

Figure 86: Farming in residential area (Author, 2011)

Figure 87: Urban farming by a church (Author, 2011)

The author mapped out areas on the site of a slope below 3 percent to use for farming. This would allow planting without a need for terracing which would otherwise require more funds. The slope would also enable flood irrigation to be used but still have enough time for the water to infiltrate into the planting beds.

Another challenge was the 50 year flood line which covers almost all the land along Pienaar's River. The author believes that this strip of land is still suitable for planting as the floods are reported not to be frequent enough to cause much damage to vegetables.

This study does not intend to concentrate on urban agriculture as a theme or focus area but rather present it as an activity that can bring people together both those involved in farming and their customers. As already demonstrated by the outlined benefits, bringing urban agriculture into this project attempts to reclaim and revitalize the deserted and unsafe river system in a way that the community would more involved creating a meaningful environment to them.

7.3.3. Access and Circulation

The project provides connections between the west and east as well as smaller parts of the park and the greenway system as a whole.

The site is accessed from several main points including from the rugby grounds to the north, Tsomo Road crossing in the south and Mthunzini Park from the East. Figure 89 shows other pedestrian access points from the residential area and surrounding schools as well as circulation paths linking different activity nodes in and around the park. The main paved pedestrian and bicycle track runs all along the river system linking the south and north while providing opportunities for pausing and seating under the trees forming the boulevard. From this other paths branch out connecting to activity nodes along the river. Smaller naturally looking soilcrete paths take people closer to the water edge and through the riverine vegetation. Two bridges are proposed along Pienaar's River allowing pedestrian only crossing. The bridges should be integrated into the existing movement patterns and be outside the 1:50 floodlines.

Figure 88: Arrival plaza (Author, 2011)

Figure 89: Circulation system (Author, 2011)

Vehicular access is allowed to the gardens for services as well to take out the produce but otherwise circulation is limited to the park edges. Tsomo Road connects the east and west but needs to respond more to pedestrian safety. Another vehicular bridge proposed on Sibande Avenue will assist in safely connecting the neighbourhoods. The plan also assumes that the proposed bridge on the north will be built allowing access to site and ease of crossing.

Where vehicular access is needed in pedestrian focused areas, the vehicular movement is directed by the use of bollards while the paving material and levels stay the same so as not to obstruct pedestrian movement especially the disabled.

7.3.4. Water Systems

Water forms another important element in the master planning and detail design not only for use in irrigating the vegetables but also controlling water quality in the stream. The water system is informed by the larger Pienaar's River catchment management plan.

Water from the catchment area is channelled along bio-swales and furrows to retention ponds for flood irrigating the vegetables (Figure 90). More water is harvested from the roofs and stored in tanks while greywater is directed to the on-site wetlands system for cleaning before reuse.

Collection, Cleaning, Storage and Reuse

On-site greywater from the school and community facilities is taken through a series of wetlands for treatment and storage before reuse. Rainwater catchment systems are also proposed for recycling water harvested from the roofs.

Tanks are used for storing roof water as it is relatively clean. Off-site stormwater from the streets, parking areas, paving and the rest of the residential area is channelled through bio-swales to treatment wetlands and storage ponds (Figure 91). Treated water is solar pumped into storage tanks in the towers for re-use in vegetable irrigation. Where there is excess water in the ponds it can be discharged into Pienaar's River but only when it has gone through the cleaning process at designated areas with erosion control renomats and/or gabions.

Figure 90: Water system (Author, 2011)

Figure 91: Retention pond at Mthunzini Park (Author, 2011)

Water use areas:

1. Wetland treating Greywater from the old Vlakfontein School. Roof water collected for cleaning vegetables.
2. Wetland treating runoff water from catchment. Bio-swale along the edge of the residential area direct the water to a treatment wetland. The cleaned water is then used for irrigation and play.
3. Pond storing water from the road and roof water from school
4. Pond acts as both an aesthetic feature and storage for water use for irrigation of vegetable.
5. Wetland and ponds to capture water falling from northern catchment along Magaliesberg.

7.4. CONCLUSION

The chapter submits that the *parti* diagram and concept drawings demonstrate the basic building blocks of the masterplan as recommended from the site analysis and framework. The proposed master plan revitalises and re/activates the area with community building activities. The integration of the park's natural and social systems ensures the park's sustainability. An understanding of the site's constraints and opportunities ensured that the proposed interventions are targeted at issues at hand and respond in a sustainable manner as demonstrated in the proposal of a productive landscape. The project has also paid attention to tackling the issues that currently make Pienaar's River an undesirable place. Provision of public facilities like amphitheatres ensures continued use of site for long hours, making it safer.

Whereas the park is meant for the locals, visitors to the urban agriculture gardens and markets could come from the nearby Tshwane areas. Once they area in park, the visitors are exposed to other cultural activities and arts which including crafts like basket weaving. This master plan will result in a river system with heightened relevance and meaning to the local people. The author has chosen to work at the community centre in order to take most of the ideas presented in the master plan into detail design.