Cultivating new meaning in the urban landscape: increasing food security and social capital through urban ecology

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Landscape architecture is a design discipline and a form of art. It is an art which grows, transforms, dies and revives itself in engagement with the physical world. It needs, as a design discipline, to engage with these multiple layers of the physical world to support healthy living, beauty, renewal and even survival. The environmental and social benefits urban nature provides and relies on have in recent times been redefined as 'ecosystem services'. As part of this discourse, landscape design is an art which is becoming all the more relevant for the physical world in the wake of escalating population growth, urbanization and climate change. There are still however left-over voids of land within our settlements that can become valuable for social, economic and environmental purposes. The paper explores the possibility of using these for allotment community gardening through a case study in Sunnyside, Pretoria. An abandoned stretch of land along the Walker Spruit served as a model for testing the hypothesis of increasing food security and social capital through a design that embraces urban ecology. The literature review provides numerous ideas and examples to substantiate the rationale of the approach. Guerrilla Gardening is investigated as a response to recent concepts of ecological justice and politics. The allotment culture is revisited as re-explored in recent times in Britain, Canada and Switzerland. Subsequently the concept of green infrastructure is used to explore the theory of a Continuous Productive Urban Landscape. The findings suggest that allotment culture and permaculture can be ways of reconnecting people with urban nature. The design concept of the 'three natures', builds on this underlying idea and propose how it can become a physical reality. As a result, a new identity that ties in with the original genius of place can unite two very distinct neighbourhoods in the city: Clydesdale and Sunnyside East, while providing the required social and biophysical services sustainably. The study upholds that as urban development continues to strive for greater resilience in the future, community involvement can only be central to its vision.
 Key words: urban ecology, urban agriculture, urban nature, allotment gardens, green infrastructure, landscape architecture.

Cultivando nuevos valores en el paisaje urbano: incrementando la seguridad alimenticia y el bienestar social por medio de la ecología urbana
La arquitectura de paisaje es una disciplina del diseño y también una forma de arte. Como arte crece, se transforma, muere y revive en su compromiso con el medio físico. Pero necesita, como disciplina del diseño, entramarse con las diferentes esferas del este medio físico para promover una vida saludable, la riqueza estética, la renovación y hasta la sobrevivencia. Los beneficios ambientales y sociales que la naturaleza urbana provee y en los que depende, se han definido últimamente como 'servicios eco-sistémicos'. Como parte de esta postura, la arquitectura del paisaje cobra aún más relevancia, considerando también el rápido crecimiento demográfico a nivel mundial, la urbanización y los cambios climáticos. En nuestros centros urbanos conviven todavía espacios desarrollados con áreas vacantes, estas últimas representan un valor potencial en el aspecto social, económico y como servicios eco-sistémicos. Este artículo explora las posibilidades que estos espacios ofrecen para la agricultura urbana comunitaria desde un caso específico en Sunnyside, Pretoria. Un terreno lineal en desuso a lo largo del Walker spruit (pequeño curso de agua) sirve de modelo para analizar esta hipótesis de incrementar la seguridad alimenticia y el bienestar social a través de un diseño comprometido con la ecología urbana. El movimiento activista 'Guerrilla Gardening' (guerrilla jardinera), ha sido investigado como respuesta a los últimos conceptos de justicia ecológica y política. La agricultura urbana es revisada tal como ha sido reevaluada recientemente en Gran Bretaña, Canadá y Suiza. A si mismo el concepto de infraestructura verde es usado para explorar la teoría de un Paisaje Urbano Productivo y Continuo. Los resultados sugieren que la agricultura urbana y la permacultura

pueden ser vehículos de reconexión entre la naturaleza y la gente. El concepto de diseño de las "tres naturalezas", se basa en esta idea y en cómo puede convertirse en una realidad física. Como resultado, una nueva identidad en harmonía con el espíritu del lugar puede hermanar dos barrios diferentes de la ciudad, Clydesdale y Sunnyside Este, a la vez que proveyendo los requeridos servicios sociales y biofísicos sustentablemente. Este estudio defiende el hecho de que como el desarrollo urbano continúa su búsqueda de mayor autonomía, en el futuro la participación de la comunidad solo puede ser fundamental para este fin.

Palabras claves: ecología urbana, agricultura urbana, naturaleza urbana, infraestructura verde, arquitectura de paisaje.

It is said that the explosive growth of urban areas worldwide over the next two decades poses significant risks to human populations and the global environment, from the loss of agricultural land and wildlife habitat, to increased vulnerability from the effects of climate change. Using satellite data on urban growth, a study has calculated that the world's total urban area quadrupled in size from 1970 to 2000 (Environment 360, 2011). Experts warn that with nine billion people expected to inhabit the world by 2050, food production in Africa alone must be tripled (Giyose, 2004).

Food security in the urban context is considered a major problem which is often not recognized. Defined as "physical, social, and economical access to sufficient, safe and nutritious food by all South Africans at all times for a healthy and active life" (RSA Integrated Food Security Strategy, 2002:6), it has been found that approximately 14 million people or 35% of the total South African population was considered to be vulnerable to food insecurity in 2004. Urban hunger and hungry city dwellers are hence mounting problems. The world is thus rapidly urbanizing with significant changes in our living standards, lifestyles, social behaviour and health. These factors give rise to two major concerns: the feeding of the growing population and the environmental degradation associated within these densities.

Furthermore, as the sprawling city encroaches further into the countryside, vacant land, on the other hand, created by uncompleted urban renewal and the abandonment of city core areas, permeates the urban landscape and contributes to social deterioration. The resultant fragmented development patterns threaten ecological functions and processes. The situation is made worse by the fact that while the remaining lost space lies idle and unproductive within the city, parks departments struggle to provide designated parks with adequate acquisition, maintenance and development budgets. Three decades ago Hough (1984) predicted that we face a future of increasing energy shortage that will eventually bring about a greater concern for conservation in urban life and the way land is used. In Africa most provisioning ecosystem services, of which food production is but one, are provided in rural areas and transported to cities. The value of nature in terms of provisioning services is thus largely lost in the city environment. Since there is no shortage of land in South Africa, as is the case in Europe, the idea of food production in cities seems quite uncalled for. Issues of poverty, equity and health are leading current infrastructural response from government, while the private sector focuses largely on wealth creation. Yet, as environmental and energy issues assume a higher profile in the future, it will become increasingly necessary to lessen transportation and widen the horizons of urban design to meet new challenges. Urban open space will need to be held responsible to shoulder environmental, productive and social roles, as vital components of the urban design process, eventually overshadowing conventional park functions and civic values. Barthel, Folke and Colding (2010: 263) are of the opinion that the only way to get public support in dealing with global environmental challenges is to connect people with their interdependence with nature.

This paper hence explores the possibilities of re-establishing constructive links with the land and the natural processes that are tied to the food we eat, leading to the promotion of a new urban ecology that can enable a synergy between people and their immediate environment in multiple ways. The investigation begins with the research question which asks; how can landscape architecture help to address environmental decay and the threat of food scarcity as consequences of rapid urban growth in the developing world? The responding hypothesis accordingly follows, stating that reclaiming and interconnecting unutilized open space in the South African city will maximise its productive, multifunctional potential and can ultimately foster not only the required ecosystem services for human and biophysical wellbeing, but also identity and sense of place. The food security and social capital of urban communities are increased as a new and self-sustaining urban ecology is promoted. Urban green space can hence simultaneously cater for immediate needs of nourishment and entertainment, and long term needs of biodiversity support and psychological wellbeing. This notion actively involves landscape architecture as a design discipline as it engages with the dilemmas of the physical world in a most meaningful and pertinent manner.

Figure 1
Immediate context of the selected site, lying between the suburbs of Sunnyside East and Clydesdale.
Note the canalized Walker Spruit and the adjacent Kerneels Young Hiking Trail
and the low wall to the left as buildings turn their back to the spruit
(illustration: Rossi, 2012).

Testing the hypothesis took on the form of the design of a multifunctional community park based within the reality and constraints of a currently underutilized and forgotten linear urban open

space along the Walker Spruit in Pretoria. This is located between the low density, heritage-rich suburb of Clydesdale and the high density residential suburb of Sunnyside East (see figure 1). According to Engelbrecht (1955), after Pretoria was found as a city in 1855, Sunnyside was the first area development to the east in 1889 on a farm named Sunnyside. The direction of irrigation furrows influenced the layout of the suburb as one notes how the streets run perpendicular to the Walker Spruit. It was only merged into Pretoria in 1890 after the inclusion of the suburb of Arcadia. Although some of the old Victorian houses still stand, the subdivision of erven (which lowered their prices) and the construction of high density residential blocks in the 1950's, totally destroyed the old spirit of Sunnyside. The 2001 census classified this as a low income area. Clydesdale was established in 1898 on a portion of land of the Elandspoort farm known as Clydesdale and had greater luck in terms of historic preservation. The delicate fabric of loose-standing, single-storey residences (many in Victoria style) celebrated a hundred years in 2004. Clydesdale has been identified as an historical area of architectural significance and its urban fabric and more affluent community lies in contrast with that of Sunnyside East.

The Kerneels Young Hiking Trail is an urban trail, named after a former Mayor of Pretoria (interview: Dominy 2012), which runs alongside the Walker Spruit. The trail starts in the suburb of Brooklyn, directly opposite Brooklyn Mall shopping centre, where the Walker Spruit originates as it transects various landmarks of Pretoria, such as the Austin Roberts Bird Sanctuary, Nieuw Muckleneuk Trim Park, and Magnolia Dell Public Park. It terminates near the city centre, opposite the Caledonian Sports Grounds, before the Spruit's confluence with the Apies River. Originally intended as a pleasant walk through the city, this pedestrian pathway has been neglected and miskept. As the Walker Spruit became channelized north of the railway in Jorissen Street in the 1920's the aesthetics of the surrounding open space degraded (interview: Williams 2012). As a result, most buildings turn their back on the Spruit resulting in the isolation of the linear open space (see figure 1). It is because of this isolation that people choose to move through this space rather than linger. Furthermore, the concrete channels of the Walker Spruit are collapsing at certain points, resulting in erosive damage. The lost space surrounding the Walker Spruit thus needs to be reclaimed and facilitated through design intervention towards building a sense of place that can connect rather than separate the distinct neighbourhoods of Clydesdale and Sunnyside East.

This paper and design proposal aimed to re-invoke a sense of place by tying in with historic and current identities of place. The original farming history and the remaining architectural identity, along with a new socio-economic and urban reality needed to bridge the spruit in an attempt to unify the city physically and socially. The Consortium Fook Municipal Framework (Joubert & De Villiers 2009), addressing the underutilization of public space and the lack of public art in the city of Tshwane was taken into consideration as a local initiative. Devised by Professor 'Ora Joubert and Braam de Villiers for this specific area of the Walker Spruit, the Walter Battis-inspired beautification scheme has been taken into account and used as one of the layers of the multifunctional vision proposed.

Research methodology

According to Cilliers (2010), who is a leading researcher in urban ecology in South Africa, the term Urban Ecology is not often used locally or well defined when used. For this reason it is essential to start off with clarification of this key term that will help position the role of cities as life supporting centres. Cilliers and Siebert (2012:1) propose for the South African context the definition of Marzluff, Shulenberger, Endlicher, Alberti, Bradley, Ryan, Simon, and

ZumBrunnen (2008) an "emerging interdisciplinary field that aims to understand how humans and ecological processes can coexist in human-dominated systems and help societies with their efforts to become more sustainable." Urban ecology thus recognises cities as human dominated systems and sees humans as an integral part of the ecology of cities. The integration of the natural sciences with the social sciences, design and planning has become the pursuit for urban ecology in recent years.

This study approached the landscape design project of urban renewal through the above ideals of urban ecology. The main aim of the research was to understand the requirements of cities that deliver the essential services to their residents, utilising available natural resources efficiently and sustainably. A literature review uncovered various theoretical premises that revealed the potential to link multiple ecosystem services that can be provided by urban nature with the main requirements for sustainable use. These main requirements for sustainability are represented in figure 2 through a tripartite relationship of: the reclamation of the landscape (allotment gardens and permaculture); diversification of function (multifunctional landscape and green infrastructure) and building of social capital (place attachment, identity and sense of place). Although hinting at the well-known pillars of sustainability that balance the economic, environmental and social concerns, the above model differs in the sense that the terms imply the complexity, multiple challenges, benefits and uses found in social-ecological systems. The theoretical premises that explain the potential links between these three components and the implications for the design are discussed later on in the paper.
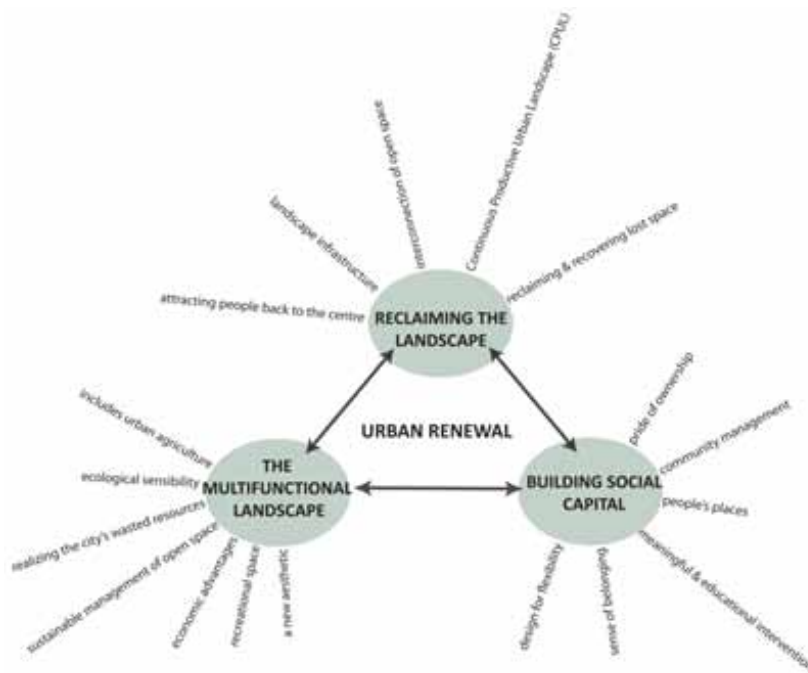

Figure 2
Research methodology: proposed approach of facilitating sustainable urban renewal through the tripartite relationship between reclaiming the landscape, the multifunctional landscape, and through building of social capital
(illustration: Rossi, 2012).

1) Reclaiming the landscape

The first step towards sustainability is to reclaim and recover underutilized open spaces within the city. It is further argued that the potential of vacant pieces of land as valuable resources may

be increased through their interconnection in order to form a continuous landscape network (after Viljoen 2005). Subsequently biological corridors and food production can take advantage of the continuous landscape concept. The landscape thus becomes the new infrastructure of the city, which may also decrease the threat of urban sprawl through attracting people back to the centre and peri-centres.

2) Diversifying the landscape function

The landscape network needs to possess values beyond mere beautification in order to be self sustaining. A multifunctional strategy (after Hough, 1984) is thus brought forward. The next step towards sustainability is thus for the landscape to include multiple uses at once. The notion of promoting food security through urban agriculture and biodiversity support corridors can both enrich much-needed recreational space. Open space will therefore become more sustainably managed through human use while a new aesthetic is ultimately promoted through these new types of 'urban nature'.

3) Building social capital

Acknowledging the sheer lack of municipal funds, community involvement is thus proposed to be the final catalyst of this vision. Surrounding neighbourhoods are hence proposed to be the maintainers of their surrounding open space (Hough, 1984), decreasing the monetary pressures on the authorities. Involving adjacent communities to economically empower themselves through allotments gardens or by creating 'people's places' that include historic references and contemporary public art, initiates much needed pride of ownership and a sense of belonging. This paper looks at how this may be approached through design in terms of flexible, robust-use spaces that allow public involvement. It may thus be concluded that this strategy will aim to foster genius loci or sense of place, through the daily actions of the residents that become rituals and traditions in time, making the design intervention all the more meaningful.

In the following section the above three building blocks for a new urban ecology that can sustainably provide for the needs of city dwellers will be substantiated through a literature review that includes case studies and examples of how this has been implemented elsewhere. In effect, we will find that most of these practices are already in place in many parts of the world. It is our current distance from productive cycles and contact with nature in the urban environment that allows us to take a passive stand towards food scarcity and the perpetual cycle of unsustainable human practices supported by our systems. Only when these practices start to influence our daily existence in more direct and evident ways for the man on the street, will the system inevitable have to make change possible.

Guerrilla gardening: a point of departure

A mushrooming global movement dedicated to "fighting the filth with forks and flowers" (Cohen, Reynolds & Sanghvi 2012), Guerrilla Gardening is an activist movement, where participants seek to transform vacant pieces of land in the city into enchanting islands of garden. Guerrilla gardeners typically transform neglected areas in illegal, yet benign nocturnal interventions in order to beautify the urban environment. It served the study as an inspiration towards spontaneous public involvement in challenging the way public space is used and managed.

According to Walters (2012), the term was first used by activist group Green Guerrillas when they transformed a New York City municipal lot into a vibrant community garden in

1973. Planted as a benevolent act of defiance, the Liz Christy garden spawned 600 others across the Big Apple, all sprouted and tended by volunteers under the banner: 'It's your city, dig it'. In South Africa, Guerrilla Gardening Associations have recently started to develop as trendy pastimes for passionate urban dwellers. Associations such as 'Secret Sowers SA' (based in Port Elizabeth) and 'The Secret Gardener' (based in Cape Town) participate in nocturnal vigilante missions. Such missions have involved planting tomatoes and nasturtiums on littered municipal land, while mixes of flowers, herbs and drought-resistant succulents have been scattered along stretches of street islands and traffic circles. Rubbish lying on vacant parcels of land is typically removed, planted, and sometimes even interspersed with edible plants for food security so that people could pick as they walk past. Guerrilla activists have planned to tend to the neglected parklands of our city where municipality lacks funding for proper maintenance (Walters 2012). This movement manifests a discourse of changing value systems and a wider socio-political involvement in contesting standard cultural connotations attached to the status and use of urban nature (Gandy 2013: 259).

Furthermore the Guerrilla Gardening movement is an inspiration as to how, through a resilient and creative community group, the city may be beautified without relying on the municipal authorities. Activists of the campaign have proven that greening the city need not be an extensive, high cost endeavour. Through small scale intercessions, the lost spaces of the city may be recovered through the power and the social capital of the community themselves. One may go about encouraging such an initiative through a catalytic and strategically-chosen focus area, in creating places where citizens are invited to initiate ownership and to partake in greening their environment. The notion of individual allotment gardens may form part of an extending flexible framework system which provides the tenants leeway for their own creativity.

Figure 3
Left: Guerrilla Gardeners at work, in Toronto, Canada
(Illustration: http://www.treehugger.com).
Right: 'Choose your future!' Guerrilla Foundation campaigning poster, New York
(illustration: http://occupychapelhill.org).

Allotment gardens and permaculture revisited - recent trends and case studies

Encouraging the notion of allotment gardens

In encouraging the move towards a more sustainable, food-secure, producer-consumer city, the notion of allotment gardens serves as precedent. Allotments are small parcels of land rented

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for nominal sums and used to grow fruits and vegetables for personal consumption. They have developed from being a significant cultural heritage into an increasingly complex and dynamic part of contemporary life (Crouch 2003: 1). According to Crouch and Ward (1988), allotments were providing fifty percent of Britain's fruit and vegetable requirements during the economic depression of the 1930s and the Second World War. During this 'Victory Garden Campaign,' allotments were seen as a way of averting both the hunger crisis and potential social unrest by mitigating some of the worst consequences of unemployment (Acton, 2011).

Figure 4
Left: In Europe, allotment gardens became popular after World War II.
This was known as the Victory Garden Campaign
(illustration: http://en.wikipedia.org/wiki/Victory_garden).
Right: The Victory Garden Campaign provided during times of economic hardship
(illustration: http://www.iwm.org.uk/history/rationing-in-the-second-world-war).

Recently, however, resurgence in the interest and demand of allotment gardens has been led by concerns over methods of food production, health and nutritional issues, and a desire not to lose any more urban green spaces to further development (Acton 2011). In working towards these goals, allotments have, in developed countries such as Britain, Canada and Switzerland, become trendy. In 2010, the national waiting list for allotment plot renting space in Britain had reached 95,000, an increase of 17,000 from 2009 (Campbell & Campbell 2010). The allotment movement has therefore, through history, successfully provided citizens with a means to survive economic hardships and, more recently, environmental and health concerns. With the rise of the urban population and the depletion of fossil fuels, there is a foreseen resultant global food crisis that makes allotment gardens all the more relevant. Urban food gardens are argued to be central elements of sustainable urban development as a form of urban governance for resilience (Barthel, Parker & Ernstson 2013: 1). South Africa, despite existing food insecurity, still needs to catch on to the movement and the valuable benefits it can offer. Local value systems and municipal regulations have not yet adopted food gardens in urban settings as has happened elsewhere. Despite a few grassroots-run community gardening campaigns (such as Afristar, The Siyakhana Initiative, and Abalimi Bezekhaya), there is still a huge need for food security initiatives in the country.

The family gardens or the *Schrebergärten* (allotments), of Zurich, Switzerland serve as a valuable case study in how allotments can be socially managed. These gardens have been running since the Second World War and have recently been revived with great public interest. Throughout

Zurich, small plots cluster in the leftover urban land between railway lines, alongside the river and on the hillside slopes above the city. The individual gardeners are typically organized in an allotment association, which leases the land from an owner who may be a municipal, private or church body, and who usually stipulates that it be only used for gardening (i.e. growing vegetables, fruits and flowers), but not for residential purposes (this is usually also required by zoning laws). The gardeners pay a small membership fee to the association, and have to abide by the corresponding constitution and by-laws (Drescher 2001).

The extensive communal space boasts colourful, diverse and productive gardens which bring with them a unique sense of place and peace away from the city bustle. In urban Stockholm, Barthel et al. (2010: 263) found, that allotment gardens can provide fertile soils, flowers and vegetables, but also ecosystem services like pollination and pest control that has an effect on the broader urban landscape. Allotment gardens have thus installed a new zeitgeist in the 21st century city as it allows citizens to rub shoulders in a meaningful way with one another, and to bring a human scale and complexity to the otherwise highly zoned and mono-functional districts of the city. Allotment gardens hence prove how the landscape can become self-sustaining and how citizens can become self-sufficient all the while a sense of pride and the associated social capital is built upon and reinforced. The Schrebergärten of Zurich are perhaps the most visible examples of spaces in which the individual citizens are enabled to control and adapt pieces of the city.

Figure 5
Right: Aerial view of Zurich's *Schrebergärten*
(illustration: http://www.panoramio.com/photo/3553095).
Left: Closer view of the allotment gardens with their summer houses and tool sheds
(illustration: http://view.stern.de/de/original/Sommer-Garten-Schrebergarten-C=Schrebergarten-
Schwartz-Natur-%26-Landschaft-712440.html).

Designing for an allotment culture

Crouch & Wiltshire (2005: 130) ask, what then are the legitimate roles for designers from beyond the plot-holding community? At a higher scale, the designer as urban planner can help integrate allotments in creative ways into the urban scene to achieve valuable synergistic effects. Learning from the experience of good community architecture, landscape architects urban designers and architects are enabled to translate ideas using their own expert knowledge of efficiency of space use, tolerance, and the potential of particular materials. There are possibilities for integrating allotments with other related open space and built uses, such as recreational space, play areas for children (while the parents cultivate their crops), the design of demonstration areas, nurseries, and market areas where excess produce can be sold. Allotment facilities may be shared by

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gathering spaces associated with benches and the beautification of public art, as opportunities for social intimacy within the allotment and across its boundaries are reinforced. Additionally, incorporating the allotment patchwork with that of a multifunctional landscape in its recreational and pedestrian means invites multiple visitors throughout the different times of the day to the public open space, facilitating passive surveillance.

It is argued that some details of the design should be left open as opportunities for people to express their creativity and to create a sense of ownership among the community (Crouch & Wiltshire, 2005: 131). The designer should thus facilitate yet not define the specific outcome of the allotments themselves. It is believed that landscape architecture, therefore, adds value in realizing the potential of the tradition of allotment gardens. The landscape architect adds the dynamic of spatial structure and organisation to the allotment plot, acting as a mediator to these processes. Sense of ownership is thus promoted through this flexible framework. Summarised by Dewar & Uytenboogaardt (1995: 45-46), one should essentially design the preconditions for complexity to occur. A sequence of formal space-making actions gives image to the site and direction to private actions which push out from this framework.

Re-connecting with nature: promoting permaculture

The notion of allotment gardens may be further enhanced by permaculture practises. Easily described as 'ecosystem gardening', it has been shown that permaculture intensifies the connection occupants have with the living environment. This brings in the educational component of nurturing the environment and growing one's own food as the benefits therein are made tangible. Envisaged in the 1970s by Australian ecologist Bill Mollison, permaculture uses principles of design found in natural systems to create abundant, self-regulating and sustainable systems of food production that nourish and replenish nature while providing for human needs (Afristar Foundation 2012).

Figure 6
The natural, 'untamed' quality of a food forest at County Cork Community Gardens, Ireland (illustration:http://blog.travelpod.com/travel-blog-entries/danielandeileen/6/11224578640/tpod.html).

Figure 7
The Walter Sisulu Environmental Centre's 'Living Classroom Garden:'
A permaculture demonstration area in Mamelodi, Pretoria
(photograph: Rossi, 2012).

Permaculture principles are hence the result of observation of natural systems. It is an inexpensive, environmentally-efficient method of cultivation. Permaculture is also suitable for implementation without excessive cost. Artificial fertilizers are avoided through the nitrogen fixing of leguminous plants (i.e. beans, alfalfa) and organic composting to recycle nutrients. Furthermore, pesticides are omitted as pests are deterred through less vulnerable polycultural planting, crop rotation and the encouragement of predators (i.e. chickens, ducks) to frequent the ecosystem. It may be added that produce grown without pesticides and fertilisers and in an organic regime are higher in nutritional value than those grown conventionally, due largely to the health of the soil (Sherriff in Bohn & Viljoen 2005: 227).

Permaculture therefore possesses the potential of enabling the city to re-establish constructive links with the land and the natural processes that are tied to the food that is consumed. However, allotment holders would need to be trained and educated through the likes of a designated model garden and demonstration area within the allotment facility in order to facilitate the passing on of this valuable skill. One such example is the Walter Sisulu Environmental Centre, established in 2009 by the Jewish National Fund and the Gauteng Department of Environmental Education in Mamelodi, Pretoria as can be seen in figure 7.

Green infrastructure and the multifunctional continuous productive urban landscape

Although rooftop gardens and green walls have started manifesting in South African cities, we do not face the urgency of land shortage as in the case of Europe. Yet the current cultural value system favours these examples of technological advance over the more traditional model of agricultural allotments. Hough (1984:253) emphasizes that the problem in urban environments is not currently shortage, but effective use of land. It is the reclaiming of unused, forgotten 'lost' space within our cities that the notion of Green Infrastructure thus seeks to attain. According to Kambites and Owen (2006), Green Infrastructure is a connected network of multifunctional, predominately un-built space that supports both ecological processes and social activities. This theory therefore identifies opportunities for the restoration, retrieval and enhancement of open space in already developed areas. Simultaneously, a broad unifying vision is provided for the future.

Building on the notion of Green Infrastructure, architects Bohn and Viljoen (2005) have conceived the idea that the structure of our cities could be changed for the better by overlaying productive urban landscapes with the concept of continuous landscapes. Viljoen (2005:xvii),

defines a Productive Landscape as an open urban space planted and managed in such a way as to be environmentally and economically productive in its capacity to provide food from urban agriculture, whilst increasing biodiversity. The idea is that the Continuous Landscape and the Productive Landscape together result in a "Continuous Productive Urban Landscape" (CPUL, pronounced *"See Pull"*), which is productive in economic, social cultural and environmental terms. This is placed within an incremental urban-scale landscape strategy and does not yet exist in cities.

Therefore, most uniquely, the CPUL allows space for urban agriculture within the resultant urban green lungs of the city. In this way urban parks could become wilder and healthier by allocating parts for urban agriculture. Fingers of productive landscape may link, like bridges, associated but physically isolated activities and areas of the city. Any one piece of land supporting urban agriculture may vary in size from several square metres in area to several hectares (Bohn & Viljoen, 2005:240). The resultant continuous landscape of reclaimed fragmented lost space also provides opportunity for the integration of urban routes, enhancing the significance of individual open space within any urban network. Bohn and Viljoen (2005:110) enforce, "to be able to walk continuously onwards from an open urban space extends the space beyond itself and into a very fine and slow layer of inner-city movement. The potential for such movement encourages occupation and occupants as well as shaping the form and layout of open urban space".

A successful example of such a landscape is New York's High Line, designed by James Corner's Field Operations, implemented in 2009. This notion also provides opportunity for the Walker Spruit site in question, as the Kerneels Young Hiking Trail is in need of a revamp and possesses the opportunity to extend further into the city.
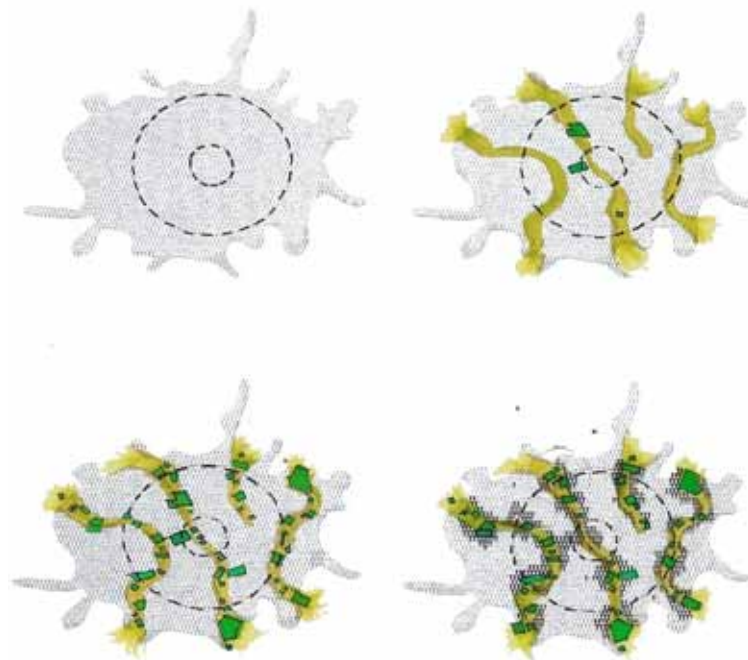

Figure 8
Creating a CPUL as an urban design strategy
(illustration: Bohn & Viljoen, 2005:13, manipulated by Rossi, 2012).

Overlaying the notion of Continuous Productive Urban Landscapes (CPULs) with Green Infrastructure allows for the provision of food from urban agriculture as a new type of landscape

is created. The interconnection of this open space maximises its potential as a productive landscape, whilst simultaneously providing for ecological corridors. The provision of pedestrian and cycling pathways assists in stitching this landscape network together. These development strategies not only restore and rejuvenate the urban ecology whilst providing food security, but may provide the impetus to attract people back to the centre.

It has been shown through case studies (Bohn & Viljoen 2005) that it is more effective when a continuous landscape is assembled in incremental stages, as a series of small interventions eventually lead to an extensive network of connected spaces within the city grid. The connected space consists of existing parks that are attached to lost space within the city. The specific focus area of this study along the Walker Spruit in Pretoria is an underutilized greenfield and will serve as a theoretical pilot project and catalyst area for the ultimate CPUL vision for Tshwane. The paper aims to illustrate that the focus area can become a catalytic 'hub' of urban agricultural and community park interventions, linked together by the revamping and eventual extension of the Kerneels Young Hiking Trail. The only hindrances to this are our socio-cultural system of value and the associated municipal by-laws.

Figure 9
Photo collage indicating how CPULs may be integrated with footpaths, cycle networks and market garden infrastructural intensification
(illustration: Bohn & Viljoen, 2005:293).

The multi-functional landscape

While leisure and beautification are the conventional cultural functions of urban parks, there are other environmental and productive functions: regulating, supporting and provisioning, that the city's land resources should serve which have been largely neglected (see Farina-Marques, Lameiras, Fernandes, Silva & Guilherme 2011: 253 for a summary of supporting research in the last decade substantiating the role of ecosystem services in cities). This is where the notion of a multi-functional landscape comes into play. Demanding more from the land in a sustainable way, a multi-functional landscape is a combined utility, recreational and ecological landscape which is maintained by the cycles of nature and the benefitted community which runs it in the human dominated environment of the city. Multi-functional landscapes thus allow for richer, more diverse and more useful urban places that make the most of available resources, as ecosystem services are intensified.

A multi-functional landscape provides numerous and interrelated benefits. It exploits the wasted resources of the city and puts them to use, making urban agriculture all the more feasible, whilst ecology is returned to the city through green corridors that reconnect the city to the surrounding landscape. The land is hence elevated as an ecological, productive economic resource which promotes food security. As the natural processes of the land are re-established, through notions such as stormwater harvesting, permaculture teachings, and de-canalization of rivers (such as the Walker Spruit), the opportunity of the education of this process is promoted through awareness and skills transfer. Related facilities (demonstration areas, nurseries, market areas), elements of recreation (gathering space, play areas, public artworks, allotment gardens) and connecting paths (pedestrian and cycling movement) add spatial structure and organization to this landscape. A new, vernacular aesthetic which looks towards the needs of the future can thus be delivered.

Urban ecology providing identity and sense of place

Building social capital: strengthening community bonds

Enabling people to build communities, to commit themselves to one another, and to knit together the social fabric brings about a sense of belonging whilst social networks are built. This is what the sociological term 'social capital' implies. It constitutes the 'glue' that holds communities together and refers to the foundations and connections that shape the quality and quantity of a society's social relations. Social capital is hence the idea that social relations have productive benefits. Dekker and Uslaner (2001) describe social capital as the value of social networks, bonding people and the bridging between diverse people with mutual benefit. Through interchange, cooperation, pro-activity and leadership, a strong sense of community may result from interaction and participation. Social capital thus allows citizens to resolve collective problems more easily, while teamwork is strengthened to gain shared and sometimes even economic results.

The suburb of Clydesdale adjacent to the focus area already has an established sense of community, their social capital attributing to the many threats of development the community has fought against successfully through history. Furthermore, south of the focus area, the high density region of Sunnyside East has newly developed established community ties. In an effort to facilitate the social capital of Sunnyside East, whilst building on the potential Clydesdale has revealed, it is believed that community participating in municipal open space planning could activate and, in the case of Clydesdale, strengthen the social capital of these respective communities as the community is allowed to become involved in decision making concerning their own neighbourhoods.

It is proclaimed by Hough (1984: 243) that the social relevance of parks and open spaces is directly connected to the level of public involvement. It is the community-based initiatives and their collective actions which become a natural part of the effort of social reconstruction and an effective way of managing cities. For example, community gardening has been found to enhance community interaction, reduce vandalism, improve food security and improve the physical characteristics of low-income surroundings. This intervention has power because it releases social energy and creates the desire to serve the community whilst establishing a sense of ownership. Design is thus made sustainable through community pride. Hough (1984:243) has predicted that the urban park of the future will be seen, less and less as a free good, provided

by the public authority, and more and more as an economically self-sustaining environment supported by community action and participation. This guarantees diversity and future relevance.

It is thus proposed that numerous parties may be involved in the multifunctional, utility landscape envisaged. It has been suggested that the main clients to be involved for funding purposes are the City of Tshwane Metropolitan Municipality (CTMM), the Department of Agriculture and the CTMM parks division. A non-governmental organisation such as the Afristar Foundation will be needed to assist in the passing down of the acquired skills, while the existing community groups of Clydesdale Village Association and Sunnyside East Residents and Ratepayers Association (SERRA) will maintain the upkeep, management and spirit of the place (see figure 10).
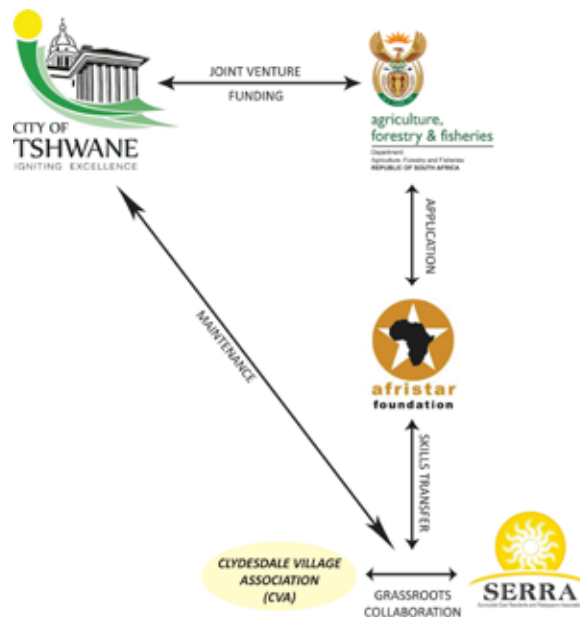

Figure 10
Proposed relationship between client and funder
(Illustration: Rossi, 2012).

The mixed land uses of multifunctional landscapes have inherent social benefits (see figure 11). When place of residence is juxtaposed with places to work, shop or recreate, social integration of different incomes, races or ages is encouraged since people will tend to walk more and drive less. With this kind of social integration, the bonds of authentic community are formed (Audirac & Shermyen 1994: 163). Achimore (1993: 34) and Talen (1999: 1368) assert that the mixture of residential and commercial land uses creates a multipurpose space in which lingering is encouraged, creating a setting for repetitive chance encounters which, in turn, has the potential to build and strengthen community bonds. Talen (1999: 1366) further confirms that a sense of community has been linked to social control of the neighbourhood and to public ownership of neighbourhood facilities as well as threats to personal or land security which result in common goals. The concept of allotment gardens therefore provides major potential for the strengthening of community bonds. Food growing projects can act as a focus for the community to come together, generate a sense of "can-do," and also help create a sense of local distinctiveness, a sense that each particular place, however ordinary, is unique and has value (Garnett 1996). The economic empowerment associated with food gardens, goes without saying.

In summary, interaction of community members may be enhanced by providing more venues for social interaction and gathering. These areas need to be positive and well-defined

in order to foster a community spirit, similar to the existing proposition towards beautification and public art put forth for the area by the Consortium Fook Framework (Joubert & De Villiers 2009). Furthermore, community facilities are important place-making elements, while it is these places that impact the lives of many and from which many escape from the poverty of their individual circumstances (Dewar & Uytenboogaardt 1995: 48). In short, open space planning should be concerned with community building. An investment in the place, in its social and physical setting, is thus an essential element that makes the neighbourhood park relevant, meaningful and even self-sustaining.
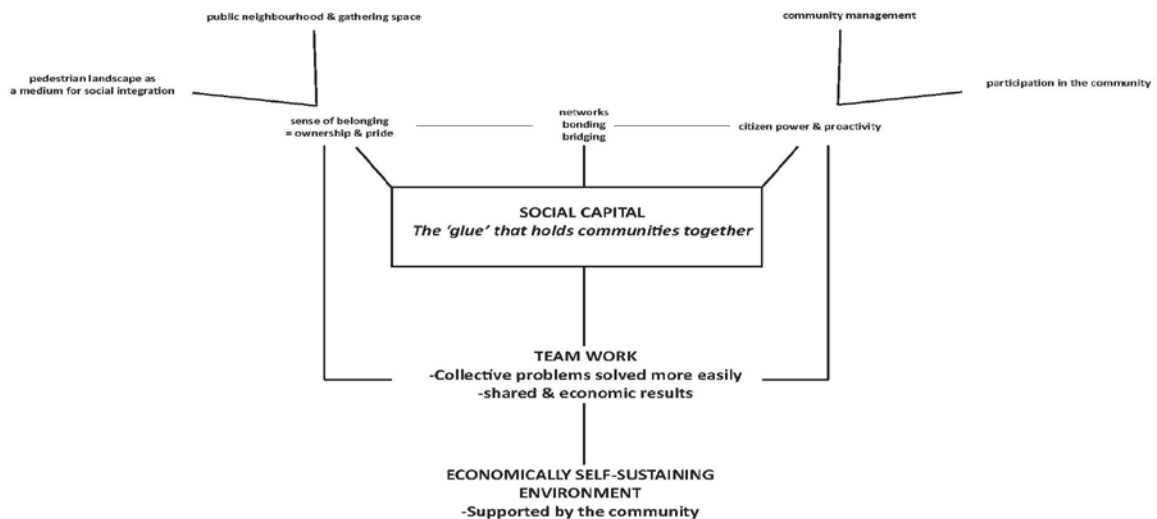

Figure 11
Diagramme indicating how social capital may be built in a community
for an economically and self-sustaining environment
(illustration: Rossi, 2012).

Previous research indicates that allotment and community gardening can encourage the involvement of collective individuals, whilst generating a sense of ownership. These bonds can ensure the relevance and utilization of the space, necessary for its upkeep into the future. Through management of the project by the community associations (see figure 10), pressures on the authorities can be decreased whilst pride of ownership and a sense of belonging may be established. This paves the way forward for establishing social capital and its self-sustaining benefits within the given community.

Design concept and project vision

The idea of introducing the three faces of natures (after John Dixon Hunt, see Plinius 2009) by means of a point, line and grid system (after Architect Bernard Tschumi's design of *Parc de la Villette,* see Thompson, 1999: 101) became the conceptual drive of the design intervention for the Walker Spruit (see figure 12). This concept ties in strongly with the theoretical approach through urban ecology that allows us to see and appreciate urban nature in different ways.

In *De natura deorum* Cicero wrote "We sow corn, we plant trees, we fertilize the soil by irrigation, we dam the rivers and direct them where we want. In short, by means of our hands

we try to create as it were a second nature within the natural world" (Plinius 2009). From this the ideas of the different manifestations or classifications of nature was taken by Hunt (in Plinius 2009). 'First nature' - wilderness - is the realm of the gods, but it is also the raw material for second nature. Hunt later found that Bonfadio wrote in 1541 that gardens make up the 'third nature' (Plinius 2009). This idea of the three faces of nature is manifested in the 1705 frontispiece to l'Abbé de Vallemont's *Curiositez de la nature et de l'art* (see figure 15 below, right) that shows a distant mountain ("first nature") giving way to cultivated agricultural land ("second nature") and then a formal garden ('third nature').

In the subsequent paragraphs the marriage of these two ideas, as a conceptual means to organize the multiple facets of the design, is discussed in brief.
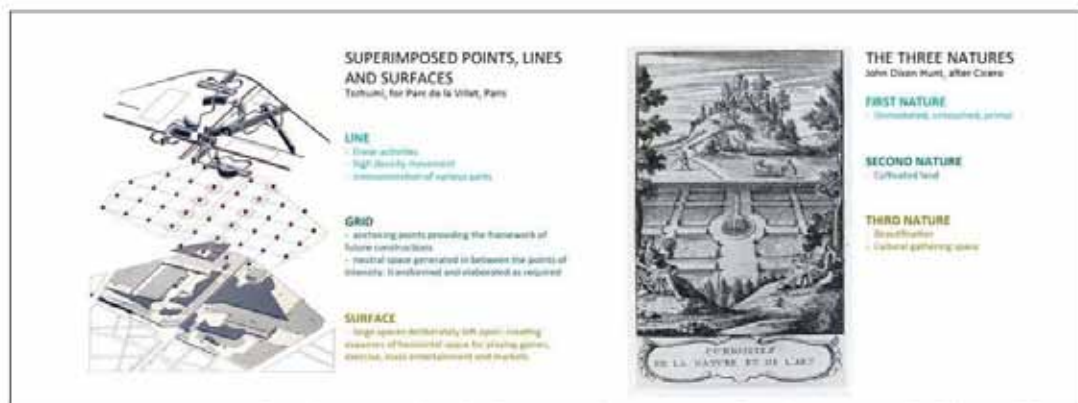

Figure 12
Bernard Tschumi's concept of lines, grids and surfaces (left, image from: http://yalestories.files.wordpress. com/2013/02/point-line-surface.jpg), alongside Cicero's Three Natures (right, images from Plinius, 2009) which together formed the conceptual drive for the project (illustration: Rossi, 2012).

Lines as first nature

The project vision is that high density routes of pedestrian and cyclist movement will stitch the fragmented landscape together alongside the ecologically-restored Walker Spruit. Regionally indigenous species will be re-established along this area as an ecological corridor is catalyzed and re-generated.
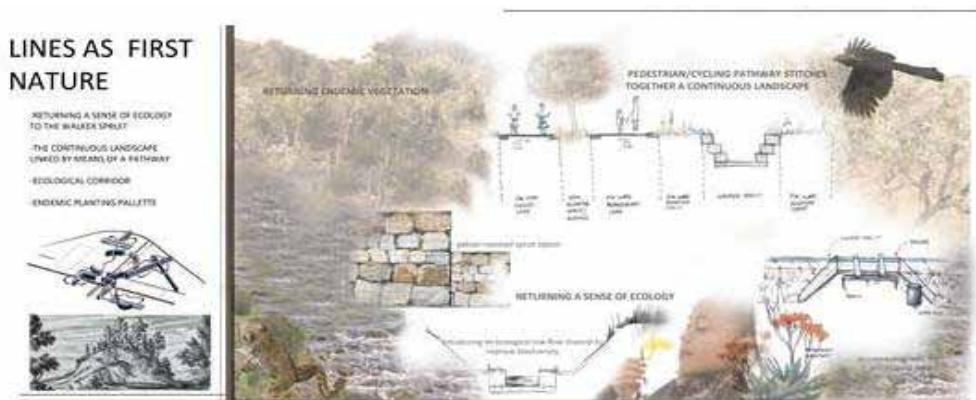

Figure 13
Vision for the manifestation of first nature along the Walker Spruit (illustration: Rossi, 2012).

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Grid as second nature

A flexible, enabling framework for allotment gardens will be established which can be transformed and developed as desired by the tenants. This allows for agriculture as a tribute to the heritage of the focus area to be built upon. Attention points, such as caretaker's residences, and other amenities such as kiosks, restaurants, canteens will support the use and activity of the area as well as aid in its passive surveillance.

Figure 14
Vision for the establishment of second nature along the Walker Spruit
(illustration: Rossi, 2012).

Surface as third nature

Expanses of both hard and soft horizontal space will be deliberately left open for social gathering events such as markets and recreational activities. These spaces will be defined by elements promoting community participation in artistic endeavours such as mosaic work (proposed by the Consortium Fook Framework, Joubert & De Villiers, 2009) and the carpentry of play equipment. The crafting of objects by the community can engage residents in the active defining of a unique sense of place. Lingering spaces will also be incorporated along the busy pedestrian corridor to promote chance encounters through frequency of use.
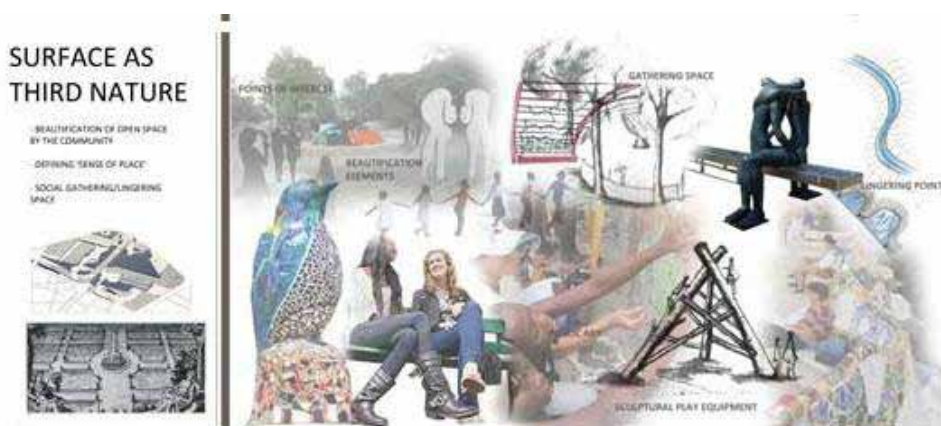

Figure 15
Vision for the manifestation of third nature along the Walker Spruit
(illustration: Rossi, 2012).

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Testing the hypothesis: designing the park in question

The hypothesis was explored as a theoretical design exercise at urban framework, master plan and sketch plan level, in order to illustrate the inherent potential of a multifunctional, food-secure community landscape at different design scales. Each of these scales along the Walker Spruit produced different challenges which will be discussed briefly. For a more detailed discussion of the design proposal, see Rossi 2012.

Vision: A Continuous Productive Urban Landscape (CPUL) for the City of Tshwane

Through the revamping of the Kerneels Young Hiking Trail, it is anticipated that the precinct of the study area may be extended to include the suburbs of Clydesdale, Muckleneuk, the Central Business District and the botanical area along the Pretoria Zoo, further towards the North. This connects multiple educational facilities, as well as many renowned landmarks of Pretoria. The rejuvenation of Sunnyside as an initial precinct has the objective to transform it into a valuable connecting node of existing institutions (see figure 16). This will encourage substantial upgrade of the area and increase property values.

The existing Kerneels Young Hiking Trail may thus become a connecting, stitching component, linking various communities involved along the continuous landscape. This possesses the additional potential of becoming a valuable urban trail for the tourist industry of the city. This initiative can be linked to the beautification scheme proposed by the Consortium Fook Framework (Joubert & De Villiers 2009), proposing the Walker Spruit to be beautified by mosaic work on underpasses and embankments inspired in the artwork of Walter Battis. The resultant spatially-continuous linear park is thus not only proposed to become environmentally, economically and food-productive, but is also a social 'walking landscape' which possesses the potential to expand further through the city.
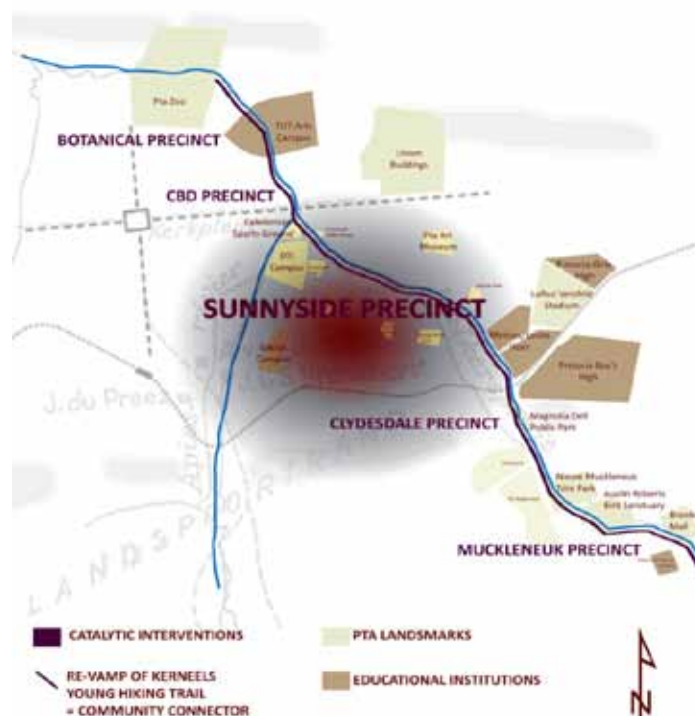

Figure 16
Sunnyside as a catalytic precinct for further expansion
(illustration: Rossi, 2012).

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A Continuous Productive Urban Landscape may thus evolve, extending into the countryside and making way for an enhanced ecological corridor. This will ensure the continuity of ecological processes, while the connectivity between habitats will improve the biodiversity of the city (Farinha-Marques *et al.* 2011: 254; Bohn & Viljoen 2005). Furthermore, this Green Infrastructure allows for city dwellers to establish renewed contact with urban nature and the physical and psychological benefits that it brings about for human living (Farinha-Marques *et al.* 2011).

Open space suitable for a broad scale CPUL intervention in Tshwane was explored by looking at aerial photographs. It has been found that the development along the river ways or 'blue ways' (TSOF 2006: 54) of the city are one of the most viable options. River way open space development in this particular urban context possesses the maximum potential to connect an extensively lengthy network of open space all the way through to the countryside, as it 'plugs' into the many existing and approved frameworks for the city along the Apies River. The resultant CPUL therefore extends towards the conservation areas of the Onderstepoort Nature Reserve in the North, and the Rietvlei Nature Reserve towards the South (see figure 17).

It has been acknowledged that this has further potential to connect open space along railways and unused road reserves. However, the possibility of ridges or 'greenways' (TSOF 2005: 45) as part of the CPUL has been avoided, as they will remain to be respected as conservation areas alone since they are not suited for the implementation of urban agriculture due to the sensitive and diverse habitats they provide (Pfab 2002). This concept of interconnected, productive landscapes in the city fabric provides incredible potential for revitalizing the city and beyond.
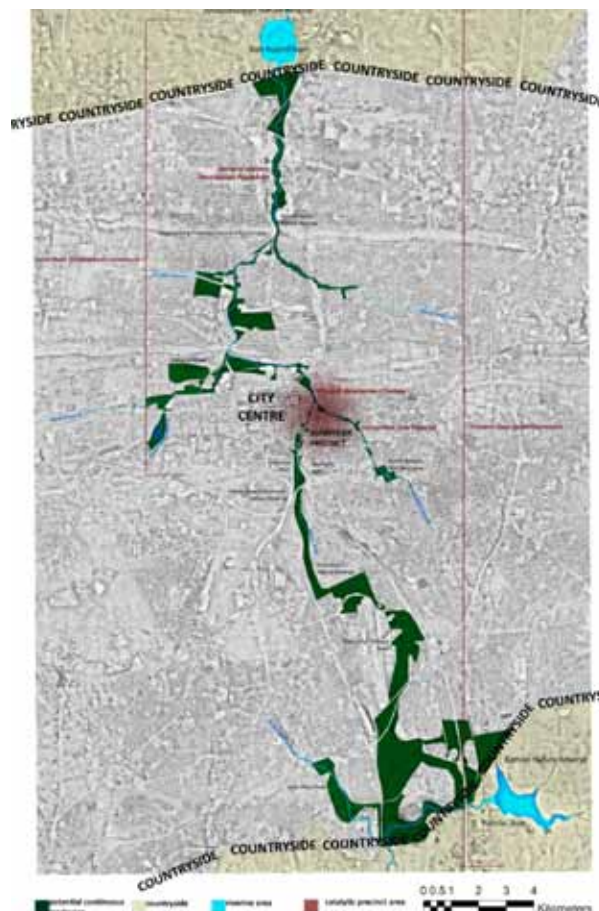

Figure 17
A Continuous Productive Urban Landscape for the city of Tshwane
(illustration: Rossi, 2012).

The masterplan

The masterplan provides a general visualization for the focus area in context. This forms a precedent for what could become the catalyst of a CPUL or Continuous Productive Urban Landscape for the city of Tshwane as the access, legibility and connection of the site have been improved. The entire masterplan is linked via a pedestrian and cycling pathway, as the existing Kerneels Young Hiking Trail is proposed to be revamped and widened. This aids in the interconnection of the fragmented site, making way for the vision of the Continuous Productive Urban Landscape (CPUL). The two metre pedestrian and cycling pathways are separated by a bioswale, lighting and indigenous trees providing shade. Resting and lingering niches are proposed to overlook the de-channelized, bio-engineered and ecologically-enhanced Walker Spruit (see figure 18). Ensuring the legibility and continuity of the site, road crossings are proposed to be paved with a course aggregate concrete rumblestone. This will also slow down the movement of vehicles to allow for the overpassing pedestrian and cyclist network.
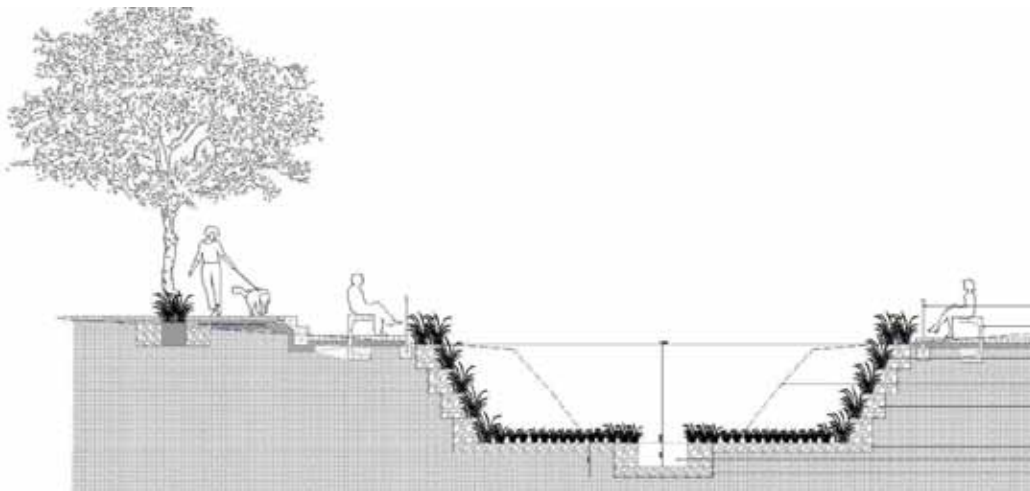

Figure 18
Cross section of the de-channelized Walker Spruit
(Illustration: Rossi, 2012).

A cyclical storyline of the sustainable lifestyle process is produced by the masterplan concept. The components of the storyline are: produce; grow and nurture; rest and recreate; sell; and recycle (their location can be traced on figure 19 as discussed below).

West of the site, a job-creating nursery has been proposed for the supply of seedlings and equipment to the allotment holders. The nursery can be privately hold or run a by an NGO. Within the middle of the site, the allotment garden scheme is proposed and is further explained in the sketchplan discussion to follow. East of the site, a play area for children has been proposed adjacent to an informal canteen with bicycle stands, catering for the school children who walk through the site daily. This initiative is proposed to be implemented by the local municipality. Terminating southwards, a hardscaped area with mosaiced curved seating walls (that can potentially tie in with Walter Battis themed beautification scheme) frame the existing large trees. This area is proposed to become flexible open space, catering for weekend food markets and related events organised by the community associations. A drop-off zone has been provided here which is punctuated with an arrival podium. Finally, crossing over Spuy Street, the existing recycling station has been proposed to become formalized as a private or local government run system.

Figure 19
The finalized masterplan
(illustration: Rossi, 2012).

The sketchplan

Water became a powerful design driver of the sketchplan, especially considering the agricultural theme of this investigation. After lengthy research explorations, the waterwheel method of harvesting water was chosen due to the fact that it does not depend on fossil fuels for operation. It was found that the waterwheel would pay tribute to the heritage of the site, being a farm irrigated by the Walker Spruit through the use of waterwheels during Sunnyside's early development. This would become a sculptural, as well as a functional element within the site that would commemorate the area's history. Once the storage tank has been filled, the water will continue to be channelled along an overhead aqueduct, and fall down to ground level via an oversized rain-chain-inspired falling water feature. The water then continues to flow within a mosaiced water channel as it pays reference to the historic irrigation furrows that were once used in the area and commemorates the art of Walter Battis. The decorative channel winds through the site whilst creating a playful, animating element of interest for the children's play area before it gets channelled back into the spruit.

Each allotment acquires its own tap and treadle pump. The treadle pump system that relies on man power alone has been proposed to supply the adequate amount of water pressure, should tenants wish to water their crops with a hose (see figure 20).
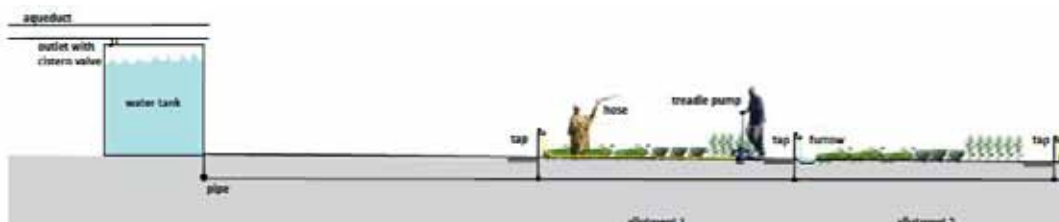

Figure 20
Conceptual diagram of the proposed irrigation scheme for the allotment gardens
(illustration: Rossi, 2012).

The rest of the sketchplan is explained by zone. Please refer to the key plan figure 21 below for the location of each zone within its given context of the design.

Figure 21
Sketchplan zones
(illustration: Rossi, 2012)

Zone 1: The waterwheel and market area

This flexible open space illustrated in section in figure 22, will serve as a market overflow area during busy weekend periods. Bicycle stands are also included at the arrival point of the zone to encourage sustainable transport. The 'edible arboretum' where local traditions and medicinal use meets permaculture, will include small to medium-sized indigenous trees which produce edible fruit. It is proposed that each tree will be labelled appropriately, encouraging what to taste, touch and smell, and explaining to what effect. Children's play equipment will also be situated here. This small park can be implemented by combining local municipal funds and community association participation, management and maintenance.

Figure 22
Section indicating the waterwheel, and Walker Spruit relationship
(illustration: Rossi, 2012).

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Figure 23
Section indicating the bicycle stands, 'edible arboretum,' aqueduct and pergola shading the hawker's stands alongside the ecologically-enhanced Walker Spruit
(illustration: Rossi, 2012).

Zone 2: The caretaker's cottage and demonstration garden

Zone two includes a services building with the caretaker's lodging on the first floor. The allotment model proposed combines elements of the discussed existing examples but is unique since it makes use of a live in care taker. It is proposed that the land remains municipal but the zoning allows for urban agriculture. The caretaker and demonstration garden can be run by a non profit organization and the community associations can manage the allocation, lease and maintenance of the allotments. A small leasing fee to allotment holders will ascertain use and upkeep of the area as a unit. It is thus proposed that a designated caretaker will live on site and be in charge of the surveillance and access to the allotment plots and the maintenance of the demonstration garden that provide learning for locals. The mentioned building will serve as the only entrance through which the allotment tenants can access their plots and provides control and security. Although it would be ideal to have an open system and free for all access, some access control had to be provided for security. Thus access cards are proposed to provide access for individual tenants, while physical and visual access for the general public was prioritised as far as possible. The building is proposed to have a public wing that includes male, female and disabled ablution facilities (accessed at and maintained by a small fee), a privately run kiosk and a community association admin office. A 'tool library' run as private initiative or by the non-profit organization, where tenants are able to rent gardening tools is also proposed. A permaculture demonstration garden run by the non-profit organization and maintained by the caretaker stands opposite the large veranda. Public entrances allow access to this area but will be locked at night. A 'viewing platform' from the adjacent restaurant overlooks the demonstration garden (see figure 25), providing the public with further visual access to this educational feature.

Zone 3: The allotment gardens and viewing platform

Zone three includes the de-channelized Walker Spruit with one of three viewing platforms which overlook the allotment gardens, allowing passers-by to linger and watch the gardeners at work as the plots change with the seasons. This is indicated in section in figure 24. These are raised one metre high with compacted fill from the spruit excavations. There are two sizes of allotments to choose from: an 8m x 4m meter family-sized allotment and a smaller 4m x 4m allotment. These are bordered by 0.8 meter-wide grass block pathways. Composting facilities consist of brick walls which envelop organic waste heaps. These might be turned and maintained by the allotment holders through a rotational system overseen by the caretaker. Resting spaces beneath retained existing large trees will be paved and consist of low seating walls and drinking fountains, while others will house climbing structures and play equipment for children.

Figure 24
Section indicating one of the raised platforms, the pedestrian and cyclist pathways, and the de-channelized Walker Spruit alongside the proposed urban forest
(llustration: Rossi, 2012).

Zone 4: The restaurant area

Zone four indicates the proposed restaurant area. The aim is to draw visitors from the surrounding consulates and other areas to engage with the cultural reality of the area. A curvilinear platform provides an additional outdoor seating area for restaurant guests which could double up as an events area. This one metre-high platform is designed to overlook the allotment gardens and will be filled with material from the excavations done of the spruit works (see figure 25).

Figure 25
Section indicating the raised restaurant platform overlooking the allotment gardens
(illustration: Rossi, 2012).

Zone 5: Open lawn area with decorative channel feature

Zone five depicts the area of the site where most of the large, existing trees occur. The allotment scheme has thus been omitted here, while the trees are to be preserved and celebrated with a decorative water channel (see figure 26) which weaves through them, paying reference to the historical irrigation channels which were once used in the area. Within the open lawn area, the shallow concrete channel will be mosaiced with recycled tiles and other found, creating an awareness of the value of recycling. The vision is for community volunteers to engage in these activities, facilitated by a local artist and inspired by historical or contemporary artist that lives or lived in the area (like the example of Walter Battis). This participatory art projects has already occurred in Clydesdale in 2010 when the Loftus traffic circle was embellished with a mosaic fountain with motifs from Battis's art (implemented by the Consortium Fook). Further north the channel morphs into sculptural seating- providing a playful reclining element. This aesthetic

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waterway eventually flows back into the Walker Spruit, over a textured outlet at the edge of the concrete channel.

Figure 26
A section indicating the open concrete channel with a typical weir where children might play
(illustration: Rossi, 2012).

Conclusion: new meaning for landscape architecture in urban contexts

The multifunctional landscape proposed not only provides for food security that was highlighted as an important shortcoming of South African urban spaces, but also realizes the land's ecological, historical and social potential. The design concept ties in ecologically with the idea of the 'three natures' that manifested physically as lines, grids and surfaces in the design (see figure 27). The landscape design also reveals three historical layers of the site as the past, present and future are given a chance to be remembered, lived in and modified. The connecting linear elements of the site will strive to restore some of the original ecological qualities of the site, whilst the historical layer of the site as a farm has been revealed and paid subtle tribute to through the provision of the allotment gardens, waterwheel and water channel. Finally, the much needed recreation, open, social gathering and lingering spaces between these elements provide opportunities to be appropriated and beautified by the community, giving a heightened sense of place and belonging to the area today and in the future.

This exploration argues for the significant potential of food secure, multifunctional landscapes to engage community participation and change the way people interact with and value urban nature. It is believed that seeing people as part of city ecology, this is the way forward for meaningful, relevant and sustainable landscape architecture which may also hold the remedy for the adaptation to urban sprawl, overpopulation, social deterioration, the abandonment of city core areas and lost space. As argued by Barthel *et al*. (2010: 264), "...stewards of urban green areas, like those engaged in allotment gardens, and the social memory that they carry may help counteract further decline of critical ecosystem services".

Though still a young and not readably accepted idea in South African cities, the realities of the physical world in the near future may compel a change in value systems and favour regulations and by-laws that will enable a greater socio-political arena to become actively involved in the reshaping of urban nature. If the predictions towards urbanization and food scarcity in Sub-Sahara Africa is to come about, our survival will obligate us to treasure not only cultural, but also regulating, supporting and provisioning ecosystem services in order to support the anthropogenic system of cities on this planet.

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LINES
AS
FIRST NATURE

GRID
AS
SECOND NATURE

SURFACE
AS
THIRD NATURE

Figure 27
Overall concept overlaid onto the sketchplan
(Illustration: Rossi, 2012).

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