Cultural landscapes as a model for natural and human systems integration

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Cultural landscapes are dynamic systems and expressions of the interaction between the industrial and cultural activities of societies with the physical world. Historic societies that developed independently from fossil fuel driven industry, had less impact on the natural environment. As a matter of course past cultural landscapes involved greater dialogue between nature, human modifications, and the value given by humans to the landscape. This nurtured a symbiotic relationship between human and natural systems. Today remnants of these previous cultural landscapes are degraded and threatened by urban development. With looming predictions of exponential urbanization in African cities in the near future, the research explored how a degraded cultural landscape can be re-engaged with the physical world to establish social and ecological health through landscape design. A forgotten and distressed cultural landscape situated in Pretoria West was chosen. This site is the former leprosy colony called Fort West, which through the study revealed a rich history of identity and significance. The aim was to develop a design methodology for the regeneration seeking to bring together the site's cultural, natural and economic 'capital' or latent potential. The integration of these three capitals into a well functioning anthropogenic system was proposed in two ways: through applying principles of ecological design; and by raising levels of awareness and knowledge in the community. The hypothetical design indicates that re-connecting systems is indeed possible but engaging with past and current narratives of meaning is central to re-establishing the lost dialogue between the landscape and human values.
Key words: cultural landscapes, ecological design, landscape architecture, Fort West, leprosy

Paisajes culturales como modelos de integración humano-ambiental
Los paisajes culturales representan sistemas dinámicos y expresiones de la interacción entre las actividades industriales y culturales de las sociedades con su medio ambiente. Las culturas que en el pasado se desarrollaron sin depender del petróleo y de su implicancia en la industria, han tenido consecuentemente menor impacto en el medio natural. En su desarrollo estos paisajes culturales del pasado gozaron de un mayor diálogo entre la naturaleza, las transformaciones humanas, y el valor dado por la gente a estos paisajes. Estos hechos promovieron una relación simbiótica entre el hombre y la naturaleza. Hoy en día, los restos de estos paisajes culturales pasados se presentan degradados, acosados y en riesgo por el desarrollo urbano. Teniendo en cuenta el pronóstico de crecimiento demográfico extraordinario predecido para las ciudades Africanas en el futuro inmediato, la presente investigación se enfoca en como un paisaje cultural degradado puede ser reconsiderado en el medio físico para así promover el bienestar social y ecológico a través del diseño del paisaje. Para el caso en cuestión, un paisaje cultural localizado en Pretoria West ha sido elegido. El lugar es la original colonia de leprosos llamada Fort West, que en su estudio reveló una rica histórica de identidad y significado. El objetivo se centró en desarrollar una metodología que congregue el potencial cultural, natural y económico del sitio. La integración de estos tres potenciales en un sistema funcional antropogénico fue propuesta de dos maneras: aplicando principios del diseño ecológico; e incrementando la conciencia colectiva y el conocimiento por parte de la comunidad. La propuesta hipotética indica que reconectar estos sistemas es de hecho posible, pero que comprometerse con el pasado y con las posturas de hoy en día es fundamental para restablecer el diálogo entre el paisaje y los valores humanos.
Palabras claves: Paisaje cultural, diseño ecológico, arquitectura del paisaje, Fort West, lepra

Over the centuries man has used signs that have varied, from pyramids, to the construction of mighty cathedrals, from citadels and castles to palaces and cities with their defensive walls. From the earliest times, man has confronted nature with these signs, to define

his place, to create community, to establish an order that makes 'world' into something he can understand (Boberg, 2004: 7).

However, in the past these defined places created by man, were always small in comparison with nature or the 'natural' land around it. In recent times this has been reversed (Boberg, 2004:7). The World Wildlife Foundation's (2012) Living Planet Report, reveals that human activities are putting such strain on the environment that the planetary systems required to sustain life on earth (i.e. clean air and water) can no longer be taken for granted as they have been for centuries. The disastrous consequences of human activities are being witnessed around the world (Twill, Batker, Cowan, & Chappel, 2011: 6). The paradox of our modern age is that at the same time as natural resources are disappearing, our demand for them is increasing due to our numbers. The consequence of living beyond the planet's means is that the physical environment is being run-down. The well-being and development of all nations are at risk, with the biggest impact being felt by the world's poorest people who rely most directly on this resource to survive (Twill *et al.*, 2011: 6). Human cultural activities and natural processes are the two main forces that have shaped the landscape as we see it today. It is these same human activities that have played a critical role in the decline of natural environments around the globe. Therefore, the challenge today is to curb this environmental decline by once again connecting people with natural systems through design in the built environment. However, cities are huge contributors to the ecological footprint of all nations. In Africa, populations are rapidly becoming increasingly urbanized. It is predicted that by 2050 Africa will have a higher number of people living in cities than Europe, Latin America or North America (WWF & AfDB, 2012). Furthermore according to the UN Habitat 2003 in sub-Sahara Africa about 190 million people are living in informal dwellings, this being the highest proportion in the world at the time (Martin & Mathema, 2010: 3). This raises intimidating questions on how an improved physical environment for all will be achieved.

In the opening years of the twenty-first century there has been a raised awareness on sustainable practice due to environmental decline that is scientifically linked to bad design practice (Corner, 2006: 23). Yet as we enter into this new age of the need for sustainable living, we may begin to shift our understanding of the built environment from something that the natural world has to be protected from, to seeing it as humanity's greatest tool by which to restore the world (Twill *et al.*, 2011: 7). Research have shown that urban dwellers who do not have contact with nature early in life and regularly are less likely to have motivations towards stewardship of the environment, for this reason it is essential that places where people live and work provide for this contact (Barthel, Folke &Colding, 2010: 263). This in turn has led to the seemingly old-fashioned term 'landscape' curiously coming back into vogue. Perhaps it is through new approaches to the design of these 'landscapes' in our cities that the built environment can be transformed from a source of environmental and social stress to a restorative fabric that can support a more resilient physical world. Landscape architecture is a design discipline concerned with the design, planning and management of (urban) open space and is in the position to facilitate this process of change.

Cultural landscapes

Pre-industrial societies developed within the constraints and opportunities of their natural environments. This harmonic relationship between man and nature resulted in the development of places which historians termed "cultural landscapes". The concept of cultural landscapes has over the years emerged as a significant way of looking at historic places that do not focus on

monuments but rather on the relationship between human activity and the natural environment (Breedlove, 2002: 162).

In 1992 the World Heritage Centre (WHC, 2011) defined cultural landscapes as follows:

> Cultural landscapes are cultural properties and represent the 'combined works of nature and of man'. They are illustrative of the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.

O'Hare (1997: 47) offers his own definition for cultural landscapes by stating that:

> The cultural landscape consists of a dialogue between the natural physical setting, the human modifications to that setting, and the meanings of the resulting landscape to insiders and outsiders. The continuous interaction between these three elements takes place over time, (in a continuous state of becoming). The concept of 'cultural landscape' therefore embodies a dynamic understanding of history, in which the past, present and future are seamlessly connected.

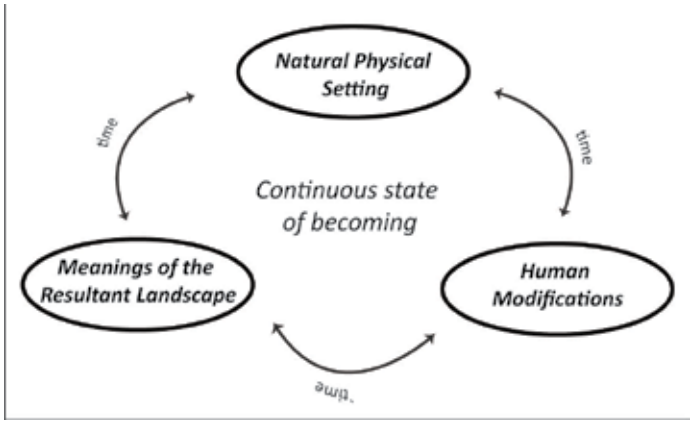

Figure 1
Illustrating O'Hare's definition of cultural landscapes (illustration: Grunewald, 2012).

While, individual definitions vary, their direction focuses consistently on the inter-relatedness between human society and the natural environment (figure 1). This reveals the important ecological functions and social values that can be found in cultural landscapes. The reviving of these functions and values is particularly valuable in curbing environmental decline in our urban environments. Fisher (1993: 31) in his research on architectural style, points out that artefacts (which can include architecture or landscape design), are encoded with values and meanings of a specific time and place and therefore they have the power to transmit past meanings into the present. This paper argues that the importance of cultural landscapes lies in their abilities to connect people with natural systems in urban environments through the encoded meanings and values embedded in and exhibited through them as artefacts.

However, many of these past cultural landscapes are under threat of being destroyed by the practices of modern society. As a result of this threat and through the growing concern about the state of the planet, the ecological functions and social values of cultural landscapes have been brought to the fore (Farina, 2000: 313). Through the acknowledgement of the physical worth and cultural values attached to cultural landscapes an approach has been developed where we can use these qualities as a basis for the development and regeneration of current and future landscapes.

This paper will explore the possibilities and potential of how a degraded cultural landscape can be regenerated to establish social and ecological health through landscape design. A forgotten and distressed cultural landscape called Fort West, situated in Pretoria West, served as a case study for the research. The research, historic and theoretical findings will be discussed. The aim was however to develop a design methodology for the regeneration seeking to bring together the site's latent potential and to explore the practical implication of these guidelines in a theoretical landscape application. The outcome was an open space framework, master plan and sketch plan design proposal for Fort West that will be briefly touched on to illustrate the implementation of this methodology.

Fort West – leprosy in South Africa

Fort West is a historic settlement that is situated at the foot of the Witwatersberg Ridge, near Danville in Pretoria West. It was formerly known as the Pretoria Leper Asylum, Daspoort Hospital, Westfort Leper Institution or simply Westfort. As a point of departure historic research of Fort West, as well as of leprosy in South Africa, were done in order to gain a better understanding of the social, economic and cultural forces that shaped the development and demise of this cultural landscape.

Throughout its history, leprosy has been a feared and misunderstood disease. According to Stanford University's History of Leprosy (2009), leprosy was thought for a long time to be hereditary, a curse, or a punishment from God. Leprosy patients were stigmatized and shunned by society before and even after the discovery of its biological cause in 1873. During the Middle Ages leprosy sufferers in Europe, had to wear special clothing, ring bells to warn others that they were close (figure 2), and even walk on a particular side of the road, depending on the direction of the wind due to the fear of this misunderstood disease (History of Leprosy, 2009). Even in South Africa there were accounts of people inflicted with leprosy having to suffer the cruelty of society, as demonstrated by this quote from Le Roux (1953: 10): "A woman and two children afflicted with leprosy were conveyed in a scotch cart through the streets of Pretoria yesterday. Many spectators viewed the gruesome sight."

Figure 2
A 14th Century manuscript depicting a leper with his warning bell
(image from Richards, 2000: 52).

Leprosy, also known as Hansen's disease, is a chronic, infectious disease involving the skin and nerves of individuals. In the past, nerve damage and other complications occurred as the disease progressed, this resulted in numbness and lack of feeling in the limbs which often led to

festering wounds on the hands and feet of patients, and then to the characteristic deformities of the face and limbs (ILEP, 2009). The discovery of the leprosy bacillus *Mycobacterium leprae* by the Norwegian Gerhard Henrik Armauer Hansen in 1873 was the first strong evidence to support the theory that leprosy had a contagious or infectious origin (Horwitz 2006: 275). In South Africa this led to the belief that strict control and segregation were the only means that would lead to a halting of new infections and thus the eventual eradication of the disease. As such in 1897 the Leprosy Segregation Law was signed into effect.

While the details of isolation varied over time, those living with leprosy in South Africa were by law strictly and forcefully segregated from the outside world into what became known as leprosy institutions or colonies. In many communities this led to an already terrible and unwarranted stigma towards those affected and their families, to escalate, causing them to be shunned and even further excluded from everyday life, in order to prevent the spread of the disease (Lawson 1957: 12). The people sent to these institutions lived, ate, worked and very often died and were buried in the confines of the institution grounds (Horwitz 2006: 271-75).

Figure 3
A view of the patient accommodation at Fort West
(photograph: Grunewald, 2012).

In 1898, the Kruger government opened the institution that was to become known as Westfort Hospital (figure 3). Westfort was just one of many leprosy institutions established in South Africa; however it was one of only two multiracial leprosaria in the country. According to Horwitz (2006) with the closure of the leprosy wards on Robben Island in 1931, Westfort remained as the only multiracial leprosarium. The physical construction of Westfort, the fence, guard towers, location and prison comparisons were symbolic of more than just the treatment of patients at Westfort. They highlight one of the themes that have run through the history of leprosy treatment and control – isolation and segregation (Horwitz 2006: 74-80).

In 1913 the Public Health Act 36, declared leprosy a notifiable disease throughout South Africa. This Act made further attempts to set up uniformed methods of dealing with the disease. As a notifiable disease, compulsory institutional segregation could be enforced for life. Teams were set up to round up leprosy patients (Horwitz 2006: 276). Therefore, it seems that life-long segregation was a public health measure and not essentially for the treatment of the patient, which was seen as secondary (Horwitz 2006: 276). This ultimately resulted in a social ignorance that had taken the word “leper” and twisted it, so that no longer did it simply mean a person suffering from a disease called leprosy, but had come to be descriptive of anything that is foul, or horrible, or unclean, or to be avoided (Lawson 1957: 71).

The first effective treatment for leprosy only appeared later, in the 1950s, with the introduction of Dapsone and its derivatives. These were exciting times for leprosy patients

around the globe resulting in some patients being released after rigorous testing. However, once released many patients found it very difficult to overcome the stigma associated with leprosy within their communities. This proved to be very stressful times in the lives of leprosy patients, resulting in many of the released patients reluctantly returning to the institutions, which were, for some, the only homes they really knew. In his book, *No More Unclean!* which relays the story of leprosy patients in Fort West during this time, E.T. Lawson (1957) describes one such situation: A lady suffering from leprosy since early childhood, is released after 45 years, spent in both Robben Island and Westfort institutions, and was, together with her family the focus of such cruelty in her community that she decided to go back to Westfort. This is the letter she wrote:

> I stand at the gates of Westfort and knock. Let me enter, O you keepers of the gates that I may hide from the peoples of the world. The song that was in my heart is dead, and the sun no longer shines in the heavens. There is a cloud that covers the face of the sun, and where I stand there is a shadow. The name of the cloud is Ignorance, and the name of the shadow is Fear; and Ignorance and Fear begat Cruelty, who drove me back here to knock. Open quickly, you keepers, let me enter, for Cruelty stands close behind me. She has lashed me with the whip that is in her hand; and she has lashed those whom I love because they took me into their house that I might be happy. Now I come back, O Westfort, that I may hide in the shelter of your mighty trees. The world shall see me no longer, and the lash will not fall on my loved ones because I am near. And here with my garden and my memories, and the songs of the birds to comfort me, will I end my days (Lawson, 1957:174).

Owing to the overuse of the drug, the leprosy bacilli became resistant to Dapsone resulting in an ineffective treatment method. It was not until the introduction of multidrug therapy (MDT) in the early 1970s that the disease could be diagnosed and treated successfully within the community (News-medical, 2012). Owing to the realization that though contagious, leprosy is fully treatable and the discovery that most people have a natural immunity to the disease; it was no longer seen as a highly infectious disease. This resulted in the laws governing compulsory segregation of patients in South Africa being revoked in 1977 (Horwitz 2006: 291). Isolation was then seen as an outdated form of control, therefore those affected were no longer institutionalized. Institutionalization for sufferers of leprosy ended in 1997 when Fort West, the last institution specializing in care of people affected by leprosy, was closed.

Fort West - celebrating 114 years

According to Dr. A. van Zyl (1989:75), who was a superintendent of Westfort, a hospital for research into the treatment of smallpox was established in the late 1880s on the outskirts of the city of Pretoria, now known as the City of Tshwane. However, this facility was never used for smallpox; instead it was used as a leprosarium from the time it was completed, due to the need for a place to treat leprosy patients.

The earliest reference to Fort West is in 1888 by the official architect of the ZAR government, Zytse Wierda (1839-1911). In 1896 he designed and, by 1898, erected the "leprozen-inrichting". His guidelines to his staff were that the place should provide "in the most humane way" a pleasant and attractive residence for those "unfortunates" who through an incurable disease would be tied to it as long as they lived. He designed the complex of buildings like a small village (Meiring 1980: 15). It was situated on the outskirts of Pretoria, away from society, surrounded by farmlands and plantations (figure 4).

Figure 4
Aerial photograph of Fort West from 1968 showing how it was situated on the outskirts of Pretoria (source: courtesy of the National Spatial Information Framework, 2012. Department of Rural Development and Land Reform. South Africa).

The first buildings erected consisted of an administration block, clinic and staff accommodation. The structures built during the ZAR period are characteristic of the type of building erected by the Department of Public Works under Wierda: elegantly proportioned, substantially built brick structures with corrugated iron roofs, stone plinths and sandstone detailing. Examples of these are the administration building, the post office, dispensary, two staff residences and South Africa's only octagonal Dutch Reformed Church (1899) (figure 5). Some of the buildings from this period have been finished in stucco, such as the dispensary, certain dormitories for patients and the first hospital buildings (Van Zyl 1989: 75).

Figure 5
Administration (left) and dispensary (right) buildings are characteristic of the type of building erected by the Department of Public Works under Zytse Wierda (photograph: Grunewald, 2012).

In its first year of existence 99 patients were transferred from the Daspoort Hospital, one hundred from Pankop and six from Rietfontein. Initially lay people were appointed to manage the hospital, but in 1900 for the first time a Dr. Von Gernet was appointed on a part-time basis as medical officer in charge (Van Zyl 1989: 75).

In the early 1900s the institution functioned as a totally independent farm and village, complete with shops, post office, police station, jail, churches and school. According to Davison (1953) agricultural land was made available to patients who desired to work the land for their own profit. Schools, staffed by qualified teachers, were provided for child patients. In addition to physical training, which formed an important part of the curriculum, boys were taught gardening and girls sewing and basket-making. He further states that the spiritual needs of the patients were met by the provision of places of worship for the adherents of the Anglican, Dutch Reformed, Swiss Mission and Roman Catholic churches.

By 1902, 328 patients were housed at the institution. At this stage the Pretoria Leprosy Asylum was divided into four compounds, namely; the European section, the Native male and female sections and the Asian section. The first full-time medical superintendent Dr. George Turner was appointed from 1901 to 1906. Remarkable landscape features of the period 1900 - 1918 are the low brick and sandstone walls that enclose a number of wards (figure 6), as well as the water furrow system for the complex. In February 1906 roads, a wall around the institution and other site works, such as the drainage and water furrow systems were completed. By 1917 the following facilities and buildings had been added: an Anglican Church (1914), Roman Catholic Church (1916), carpenter shop, smithy, bookbinding shop, laundry, dairy, orchards, produce farm, recreational facilities such as bioscope, concert hall, and library. Eight watch towers were erected and policed day and night in order to prevent patients from escaping (van Zyl 1989: 76).

Figure 6
Low brick walls dividing housing complexes are characteristic of the Fort West landscape (photograph: Grunewald, 2012).

By 1918, all leprosy patients in the Transvaal and the Orange Free State had been transferred to Westfort. It housed a total of 892 patients. In 1927 the Pretoria Leprosy Asylum was renamed Westfort Leper Institution. After the closure of the leprosy wards on Robben Island in 1931, patients were transferred to Westfort, pushing the patient numbers up to 2000. Under the auspices of the Department of Public Works, a number of substantial face-brick buildings were erected during this period (van Zyl 1989: 75). The most prominent buildings dating back from this time are the kitchen complex, theatre and store. As leprosy was a highly contagious, and at the time, untreatable disease, the original pattern of constructing isolated rooms was followed. A new structural typology was a concrete roofed rondavel, which was an attempt at making native patients from traditional areas feel more at home. This constitutes a vernacular being created for the user to familiarize himself with his surroundings (van Zyl 1989: 76).

Since 1931, as treatment for leprosy became more effective, the number of patients gradually decreased. Some patient and staff accommodation was built after 1931, including hostel accommodation for nurses. In 1979, the patients requested that the word ‘leper’ be removed and it was once again renamed to Westfort Institution (van Zyl 1989: 76).

The Fort West cultural landscape

Throughout Fort West's existence the landscape played an important role in the lives of the patients, which is evident in the account E.T. Lawson (1957: 28-30) who writes:

> Clusters of little cottages where the patients live; gardens, beautiful always – in summer, roses and all the lesser flowers that magnify the beauty of the rose; in winter, sweet-peas, stocks and Iceland poppies; gardens reflecting in their beauty the loving care of those who tend them.

Working the land was seen as both physically and mentally therapeutic. As mentioned previously, patients, if they so wished, could get a piece of agricultural land allocated to them in order that they might produce food for themselves and sell the surplus back to the institution at the store. The gardens surrounding the houses were just as important; grapevines stretched along the front of the little cottages, they had vegetable gardens at the back of their rooms, roses, and other flowers grew in abundance, all this topped off with mighty trees to provide shade (figure 7) (Lawson 1957: 80-100).

Figure 7
Avenue of eucalyptus trees planted along the entrance road to Fort West (photograph: Grunewald, 2012).

The gardens and especially the trees were seen as more for the patients than just a physical beautification; this was something that they prided themselves in, it was an expression of the freedom they no longer had. The site has over the years been heavily planted with exotic trees, especially around the eastern perimeter near the cemetery, e.g. eucalyptus, jacarandas and palms (figure 8). These trees have great significance; more than just being old and part of a cultural landscape; they were and still are an intangible sense of both confinement, as well as freedom.

Figure 8
Exotic jacaranda trees planted on the eastern perimeter of Fort West (photograph: Grunewald, 2012).

Westfort Institution was finally closed down in 1997, after a government investigation found that it was unsuitable for patients. Policy regarding the treatment of leprosy patients had changed. Leprosy had become a treatable disease and it was found that the best treatment for sufferers was to be in their own communities.

Fort West today

Over the years the City of Tshwane has grown exponentially, which has resulted in development extending far to the west. This means that Fort West, which once was considered to be on the outskirts of town, is now located in the western sector of the City of Tshwane.

After its closure in 1997 Fort West was abandoned and left to fall into ruin. Today it houses a new kind of 'colony', inhabitants society sees as outcasts. At present there are approximately 2 000 multi-racial families who have settled here illegally. These informal settlers have one common denominator though, unemployment, which according to Fraser (2007), is estimated at 90%. Phillip Williams (as quoted in Fraser, 2007) finds that there is no electricity, no running water, and no sewerage facilities. He further states that you can have up to nine people living in a small room, sometimes even with people living in what used to be the toilets. The people are living in buildings over 100 years old which are in a serious state of disrepair. These people are the new community of Fort West.

In order to address the immediate needs of the community the Tshwane Metro Municipality has installed five water tanks, which are filled daily and ten Porta-loos. Even though the addition of these amenities slightly improves the lives of the community they are not nearly enough. It was also mentioned that the community has taken ownership of these amenities and therefore keep them clean (interview with van Vuuren 2012).

The current conditions of Fort West are harsh. After many years of neglect, vandalism and greed, buildings have been gutted until just a shell remains. These are in serious need of restoration. In terms of the landscape, fragments of this once self-sustaining community can still be seen today. However, the grandeur gardens are no longer; instead they have been replaced by areas overgrown with weeds. As previously stated, many exotic trees were planted on the site; yet, even these majestic giants are under threat. According to a resident (interview with Breedt 2012), a private company has been appointed, through the Department of Water Affairs - Working for Wetlands, to cut these trees down for wood needed in the mines. Even though these trees are considered invasive exotics none of them are listed under Category 1 of the Conservation of Agricultural Resources Act of 1983 (which requires plants to be removed and destroyed). Although true that invasive exotics can be a threat to biodiversity, mere exotics do not, while they can fulfil valuable environmental and social services. Therefore this action seems harsh and without consideration of the cultural landscape. The National Heritage Resources Act of 1999 classifies "landscapes and natural features of cultural significance" as part of national estate and protects structures older than 60 years and their surrounds that: "are of cultural significance, form landmarks or express specific design intent". Yet there is no historic community to contest the cultural significance or protect the landmarks of Fort West.

Other landscape elements that can still be seen today, and which stand as testimony to the importance of the historical landscape of Fort West, are the water furrows, which formed part of the drainage and stormwater system in days past, the low walls surrounding some complexes, and lastly stone terraces and carved stone steps situated on a northern slope found just below the nurses' quarters.

The changing cultural landscape

Cultural landscapes are an expression of past human attitudes and values. However, many of these cultural landscapes today are under threat of being destroyed by the practices of modern society. As a result of this threat and through the growing concern about the state of the planet a new approach has been developed. This approach developed by Farina (2000: 313-20) uses past values as a basis for the regenerative development of future cultural landscapes. In order to understand Farina's final approach, one must first understand the evolution of cultural landscapes over time – past and present scenarios (figure 9).

In the past, cultural landscapes were created as the result of the interactions between cultural capital, natural capital and economic capital. Cultural capital refers to non-financial social assets, such as the ways of life, forms of knowledge, skills and patterns of consumption that make the places people are associated with distinct. Natural capital is the stock of a particular place's natural resources and ecological systems that provide vital life-support services to its society and all associated living things. Lastly, economic capital deals with how a community can sustain themselves through the diversified use of local resources found on the landscape. Only once this has been achieved does economic capital extend to the possible monetary value that can be gained (Farina 2000: 314-17).

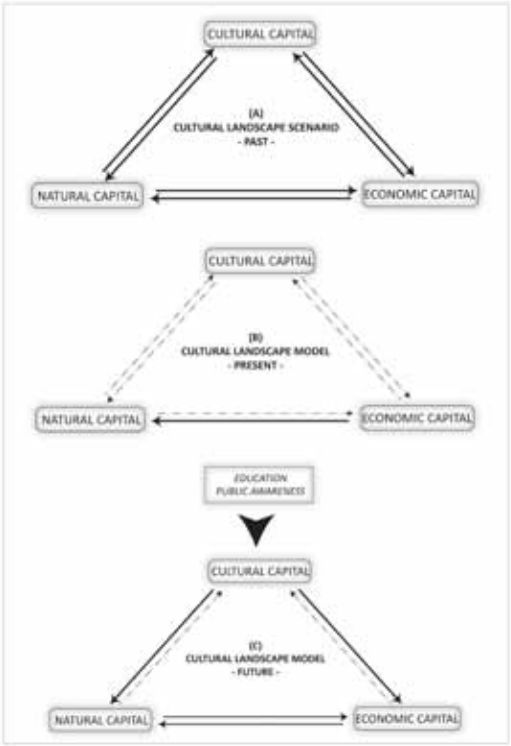

Figure 9
Relationships between natural, cultural and economic capital according to past (A), present (B) and future (C) scenarios. The dashed arrows indicated weak connections (image from Farina, 2000:314).

In the past cultural landscape scenario (see fig 9 diagram A), each type of capital interacted with the other by feedback mechanisms (Farina 2000: 319). These feedback mechanisms nurtured healthy interaction and connections between people and the natural environment. Over the years, due to the changes in the global environment, this past cultural landscape scenario has not been considered important. Owing to this, the abandonment, simplification and destruction of many past cultural landscapes has occurred (Farina 2000: 317). This has resulted in the creation of the present cultural landscape scenario.

The present cultural landscape scenario (figure 9, diagram B) differs from past cultural landscapes in many respects. Present cultural landscapes are dominated by economic capital and only consider natural capital as a source of energy or as a resource. As a result economic decisions are generally not balanced by an equal consideration for ecological processes. Instead they focus on the economic components while largely ignoring the ecological components. This has created landscapes that are ecologically and socially vulnerable (Farina 2000: 319).

Fort West can be used to illustrate these two scenarios. The past cultural landscape of Fort West in the early 1990s functioned as an independent village and farm, which sustained the needs of the resident community (figure 10). The people sustained themselves through the diversified use of local resources found on the landscape, all the while never depleting the stock of natural capital. In contrast, the present landscape of Fort West illustrates diagram B in figure 9. The natural capital, the historic trees for example, are seen as a source of energy or biomass and the environmental and cultural roles they fulfil are not valued (figure 11). The stock of natural capital is left without any sort of ecological considerations or remediation e.g. soil erosion protection (seeding of veld grass) where large clumps of trees have been removed to leave the earth bare and exposed.

Figure 10
Illustrating the past cultural landscape scenario at Fort West where it functioned as an independent village and farm, sustaining the need of the community
(source: courtesy of the Leprosy Mission &Moller, 2012).

Figure 11
Illustrating the present cultural landscape scenario at Fort West where historic tree (natural capital) is been cut down as a source of energy or biomass
(photograph: Grunewald, 2012).

It is this understanding of the evolution of cultural landscapes that led Farina to develop the future cultural landscape model (figure 9, diagram C). In this model Farina argues that the past cultural landscapes scenario can provide a powerful basis for future regenerative development, by understanding the integration and value of nature and culture. In other words, once people are made aware of and understand the unsustainable practices of the present day scenario of development and comprehend the services that the environment provides for human wellbeing, the relationship between the 'capitals' can start to be regenerated. Applying the future cultural landscape model will help reduce the formation of a random landscape mosaic that has a mono-function and has lost its capacity to sustain a healthy society.

In comparison to the present scenario, economic choices in future cultural landscapes are strengthened by a feedback loop that is based on the responses of natural systems. In future cultural landscapes, local conditions determine the mosaic of productive lands at a scale that is many times smaller than in the present cultural landscape scenario of the global economy. Cultural landscapes are based not on massive production but on the production of items in quantities sufficient to satisfy the local market. In that sense local residents are physically reconnected to the landscape that surrounds them, enabling them to also start giving value to that landscape in a spiritual and cultural sense. A true economic balance in the future cultural landscape, therefore considers not only crude income from food products but also the ecological costs and benefits of the processes involved (Farina 2000: 315-16).

However, the application of this model alone (figure 9, diagram C) will not improve social and ecological health. To face the challenges of resource depletion and the abrupt degradation of the quality of human life, it is imperative that the relationships between the three 'capitals' be strengthened. It is through the realization of these relationships between the three 'capitals' that the regenerative development of a site will take place. Therefore, the integration of these

three 'capitals' into a well functioning anthropogenic system was proposed in two ways: through applying principles of ecological design; and by raising levels of awareness and knowledge in the community.

Ecological design

Rottle and Yocom (2010: 13-14) explain ecological design as the process of actively shaping the form and functions of complex environments, in such a way that the composition and processes, in these environments, help to increase the integrity of the ecological and social relationships. It aims to improve ecological functioning, preserve and generate resources for human use, and foster a more resilient approach to the design and management of our built environments.

The principles developed by Van der Ryn and Cowan (1996: 51) two decades ago were found to be relevant for this study as blended with recent interpretation from Rottle and Yocom (2010). There are five principles of ecological design that are used to ensure a social and ecological healthy approach to design. They are: 1) Make nature visible, 2) Solution grown from place, 3) Community participation, 4) Design with nature and, 5) Ecological accounting informs design. Simply stated and connected to human action, the design principles of Van der Ryn and Cowan became potential connections to enable the linking of the three 'capitals'. Implying human action, they can facilitate emotional buy-in that can enable connection to everyday value systems.

As populations become increasingly urbanized, opportunities for people to be in contact with nature become more elusive, thus eroding cultural appreciation of the services nature provides. Taking an ecologically grounded approach to the design of degraded cultural landscapes in urban areas, enables communities to re-form and develop in ways that minimize environmental impact while increasing social equality. It serves people's needs while connecting people with nature in ways that reveal processes, promote stewardship and benefits both human and natural systems (Rottle & Yocom 2010: 16, 180). As an interactive approach, ecological design thus combines human and natural systems, in order to create resilient landscapes. Therefore, the five ecological design principles should be implemented in a manner that is responsive to both human needs as well as the natural systems operating in the landscape. Ways of achieving this are discussed in the next section.

Landscape design guidelines

The aim of the research can be summarized by the Recommendation concerning the protection, at a national level, of the Cultural and Biophysical Heritage as written and adopted by the UNESCO (1972) General Conference:

> Considering that, in society where living conditions are changed at an accelerated pace, it is essential for man's equilibrium and development to preserve for him a fitting setting in which to live, where he will remain in contact with nature and the evidences of civilization bequeathed by past generations, and that, to this end, it is appropriate to give the cultural and biophysical heritage an active function in community life and to integrate into an overall policy the achievements of our time, the values of the past and the beauty of nature (UNESCO, 1972).

To enable this, the design of degraded cultural landscapes, should be organized according to an integrated approach that brings together ecological, cultural and economic understanding that relates back to different scales of implication. This integrated approach has been achieved in

Farina's model as discussed in a previous section. However in order to ensure the regenerative development of a site the five ecological design principles (Van der Ryn & Cowan 1996: 51) together with the ICOMOS Ename Charter's (2007) heritage approach (for more detailed discussion of the heritage approach, see Grunewald 2012) have been combined to formulate design guidelines that can connect the different capitals and latent potential found on site.

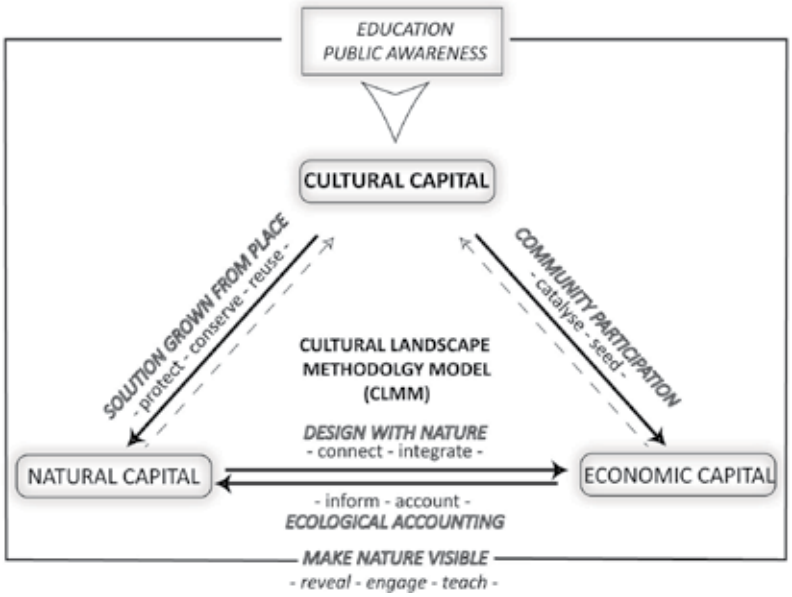

Figure 12
The Cultural Landscape Methodology Model (CLMM) developed in this research to illustrate the application of the ecological design principles to Farina's (2000) future scenario. Relationships between natural, cultural and economic capital are strengthened (illustration: Grunewald, 2012).

The application of the ecological design principles to the Future Cultural Landscape Model as proposed by Farina (2000), results in the development of a methodological approach to the regenerative development of degraded cultural landscapes (figure 12). In the Cultural Landscape Methodology Model (CLMM), developed in this research, the existing cultural, natural and economic capital available on the site needs to be established through a site analysis (see Grunewald, 2012 for detailed site analysis and design explanation). Once this has been done the Ecological Design Principles (EDP) can be applied to use the existing scenario to inform not only the "capitals" but also ways of connecting them. This understanding should guide the design decisions taken and will be elaborated on in the subsection to follow.

Make nature visible

As discussed by Farina (2000) the CLMM approaches the three "capitals" through the main avenue of education and public awareness. The landscape has to contain and tap into society's potential for knowing and learning, but more than that it has to tap into their value systems. In order to connect with this powerful resource the first step is awareness: we must make nature visible again. Therefore the over-arching element of education and public awareness will be driven by the EDP to "make nature visible".

This will be done by emphasizing natural cycles and processes involved in all three capitals, essentially bringing the designed environment back to life. Seeing and understanding natural cycles and processes will help inform the community, and other visitors to the site, of the

services nature provide and how they affect us. The design realization of this can be achieved through revealing, engaging and teaching.

Natural systems and processes occurring in a landscape should be made explicit in order to tap into nature's powerful resources as a teacher. In the case of Fort West that has a historic connection with water flow on site, this can be achieved in the form of: rehabilitating the historic water furrows; bio-filtration swales; stormwater planters; retention dams and stormwater squares. These hydraulic system components may also provide habitats for plants, pollinators and seed dispersers while enhancing the condition and psychological healing power of public open space (Rottle & Yocom 2010: 114). Figures 13 and 14 show the functioning and final vision for this aspect of the design.

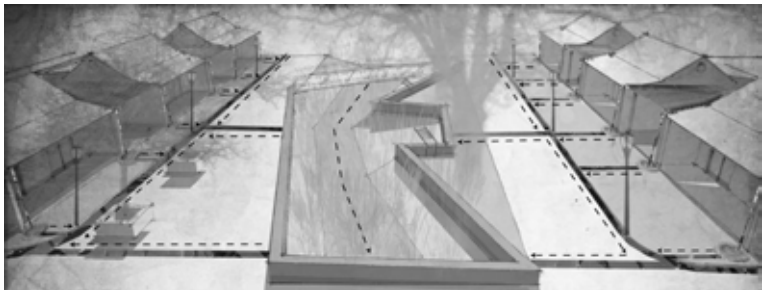

Figure 13
Illustration of a proposed catalytic intervention where education and public awareness can be facilitated in public space through the revealing of natural processes such as storm water. This stormwater collection system is proposed for Fort West's retail promenade
(illustration: Grunewald, 2012).

Figure 14
An illustration showing the proposed addition of a bio-swale in Fort West's retail promenade that can also provide habitats while making nature visible
(illustration: Grunewald, 2012).

Scientific studies overwhelmingly document the benefits of contact with nature, including recovery from illness, mental health, relaxation and concentration and lowered crime rates (Rottle & Yocom 2010: 59, Van der Walt & Breed 2012). Therefore the design accommodates a diverse public open space system and recreation activities. In the case of Fort West these spaces are proposed to include community parks, craft and farmers markets, multifunctional spaces such as squares (figure 15), rehabilitated natural areas, children's playgrounds, community food gardens and the public realm of the street. Recreation activities proposed include hiking, nature trails, bird watching, nature education, picnicking, and an information centre. Such spaces contribute to the physical, mental and social health of an area (Rottle & Yocom 2010: 49).

Figure 15
The proposed 'Fort West's square' offers a robust multifunctional space that can be used for recreational activities such as farmers markets, community meetings, weddings or music festivals (illustration: Grunewald, 2012).

The proposed design of Fort West's degraded cultural landscape strives to articulate new values and make people aware of the importance of restoring and rehabilitating the site's ecological support functions. This can be achieved through the removal of existing invasive plants and replanting with appropriate indigenous plant species that will support desired ecological processes and provide food and habitat for local species (Rottle and Yocom 2010: 86). Being so close to a rich habitat ridge environment that can also serve as a green corridor, the site can play a major role in maintaining high levels of seed dispersal and pollination in the urban environment. This will provide opportunities for the addition of design elements to draw attention to these temporary visitors (birds, insects, small mammals etc.), such as integrated hiking trails and pathways, lookout points, information markers and even an environmental education centre. Such markings and features for human interaction foster awareness of human care and place attachment, which in turn can attract additional public appreciation and stewardship of a site.

Solutions grown from place

This principle will allow for the established intimate knowledge of a particular place to be utilized in a small-scale and direct design initiative that is both responsive to local conditions (both cultural and ecological) and the community. It will allow the design to inhabit the site without destroying either the cultural or the natural capital (figure 16). It begins with the particularities of place. The task is to integrate the design with these conditions in a way that respects the health of the place (Van der Ryn and Cowan 1996: 72). The design realization of this can be achieved through protecting, conserving and reusing.

Every landscape contains a narrative of meaning related to its past and present use and function (Potteiger and Purrington, in Swaffield 2002). Yet, knowledge of its past meaning is required in order to protect a historically significant site. At Fort West the link between the past and present narrative is proposed to be reconnected by means of a visitor/ tourism enterprise that can establish and promote interpretive trails, lookout points, information boards, and local

community guides. The establishment of an information centre or living museum may also be appropriate for the last example of its kind in South Africa: once multicultural leprosaria.

In order to protect the existing 'sense of place' and former spatial composition, all historic trees that have been removed should be replaced with indigenous trees similar in spatial structure and design intent. Remaining avenues and other landmarks (including those in the form of trees and vegetation) should be retained (figure 16). A planting strategy that reintroduces a multi-layered savannah habitat (of canopy trees, small trees, shrubs, native grasses and ground covers) is also proposed in areas where invaders have been removed in order to prevent soil erosion and increase the site's biodiversity. (More details on specific species selected can be found in Grunewald 2012).

Figure 16
The existing jacaranda trees in Fort West's proposed retail promenade have been incorporated into the new design in order to protect the existing 'sense of place' and former spatial composition. Proposed small-scale farming activities that provide local produce for subsistence have been investigated through precedent studies (illustration: Grunewald 2012).

With the introduction of a potential tourism initiative, levels of privacy and exposure need to be distinguished by the landscape. This can be achieved by ensuring private and semi-private areas are lined by edges and boundaries (figure 17). These boundaries should preferably be soft and align with what historically occurred on the site.

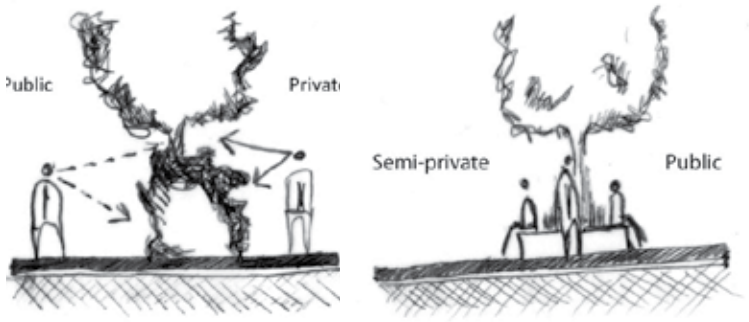

Figure 17
Edges such as hedges (left) and low seating walls (right) are proposed in order to act as visual screens as well as create opportunity for social behaviour
(illustration: Grunewald 2012 from van der Walt 2009).

Compact multi-purpose communities should be encouraged, where shops and services, such as clinics, are provided for in close proximity to where people reside and work. Circulation often

forms the structure of an area both spatially and operationally (Rottle and Yocom 2010: 136). In these compact communities walking and bicycling become viable when facilities such as primary and secondary routes, trails, sidewalks, bicycle tracks and stands, traffic calming and pedestrian-priority crossings are provided (figure 18). Amenities such as benches and lighting also encourage walking. These human scaled systems of circulation, in connection with public transport nodes, generate resilience through less reliance on external resources while supporting healthy conditions in urban areas (figures 19 and 20).

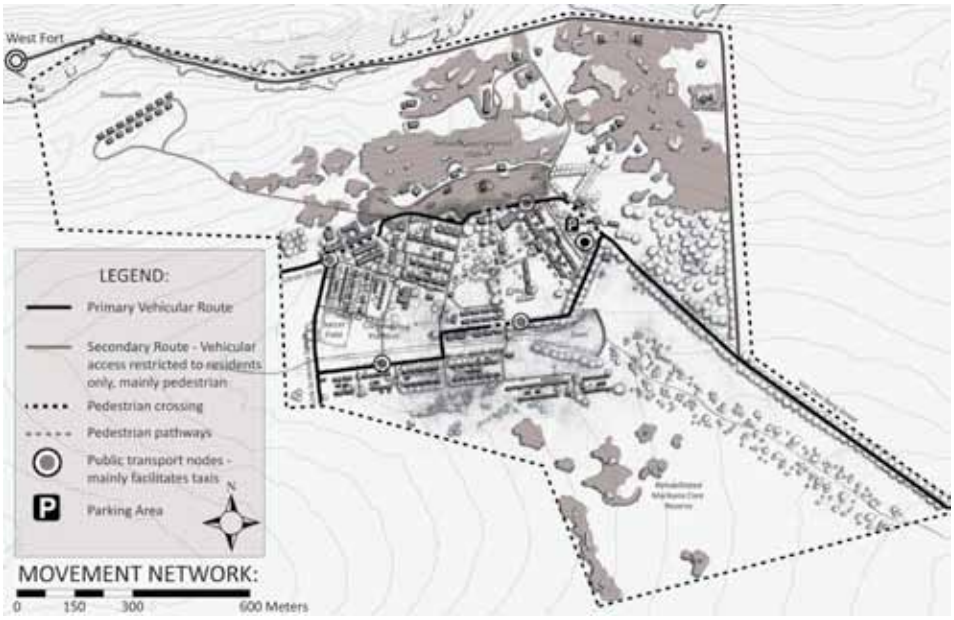

Figure 18
Framework map indicating the location of proposed primary and secondary movement network (framework: Grunewald 2012).

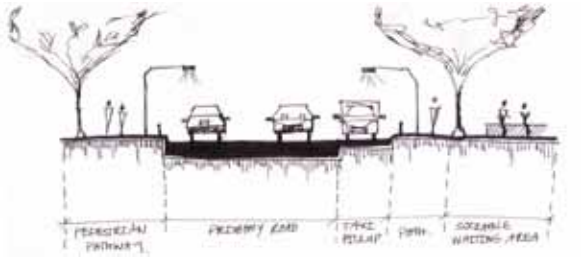

Figure 19
Typical cross section through primary route at Fort West indicating pedestrian and public transport routes (illustration: Grunewald 2012).

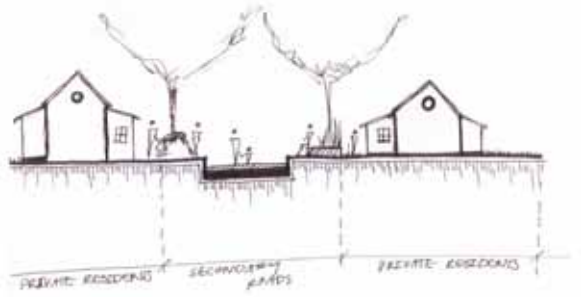

Figure 20
Typical cross section through secondary route at Fort West, the scale and character of these routes are primarily focussed on pedestrians
(illustration: Grunewald 2012).

Reuse of a site's available resources or 'capitals' can reduce the demand for off-site resources (Rottle and Yocom 2010: 106). Reuse at Fort West can take form in the following ways: adaptive reuse of existing buildings and structures, collection and reuse of stormwater in retention dams for irrigation, recycling enterprises (already existing on site), and by reusing materials collected on or available on site, such as compost from waste vegetables or garden clippings.

Community participation

In order to establish a successful economic capital on the site, it is important to listen to the community. The real needs and values of the community along with special knowledge they bring can make a design initiative practical (within the community's scope), both economically and culturally. If the economic capital established on the site is compatible with the community of people, then as people work together to heal the land, they also heal themselves. The design realization of this can be achieved through catalysing of actions that will initiate sustainable economic activities and provide seed for the community's initiative and willingness to engage.

Public participation should go beyond just the design and planning phase of a project, it should act as a catalyst for increased community interest. Participation in the construction process should also be taken into account, in order to provide some useful training, improve the likelihood of ownership and long-term stewardship of the landscape and infrastructure (Rottle and Yocom 2010: 98). Short-term projects and associated catalytic workshop training programmes are proposed to be set up in the construction phase to teach skills such as mosaic work for community art installations (figure 21).

While our societies are becoming increasingly reliant upon external resources (regionally and globally) to sustain themselves, communities should rather be attempting to become more self-sufficient and resilient through conservation and local production (Rottle and Yocom, 2010: 134). In order to cultivate opportunities for social processes that inspire human activism, community building and long term stewardship that will be required to maintain a landscape, it is proposed that community enterprises are implemented at Fort West (Rottle and Yocom 2010: 110). The appropriate enterprises were revealed through a participation process, precedent studies and through consultation with an agricultural economist. There was an effort to remain in keeping with the historic example of Fort West, while taking into consideration the natural capital of the site as a resource that should also be maintained as such. Enterprises proposed for Fort West are a dairy, bee keeping, an indigenous nursery, community food gardens and a recycling station. Although mainly aimed at subsistence these small-scale, low input cost projects have the potential to, over time, extend beyond self-sufficiency into generating income. Successful case studies around the world are discussed in more detail in Grunewald 2012. This approach is quite low key and different to other proposals that have been made in the past (see section on Hope for Fort West). Though in the past the community was self sufficient, this concept within urban areas is not the norm. To allow integration (as opposed to past segregation) it may be argued that this approach is exclusionary. The aim was not to isolate but rather to optimise the use of the land in accordance with the cultural landscape model of Fort West.

Figure 21
Illustration showing the proposed community mosaic art installations that will highlight the entrance to Fort West's retail promenade and tourism information centre (illustration: Grunewald 2012).

Design with nature

In order to make sure that the natural capital is utilized effectively and not inhibited or destroyed in the production of economic capital on the site, the design is proposed to work with the living processes found on the site (the natural capital). The goal is to provide support for all species while also meeting the socio-cultural needs of the community. By engaging the economic capital in the processes that regenerate rather than deplete, the designed landscape and the community will become more alive. The design realization of this can be achieved through connecting and integrating.

The provision of ecological corridors in urban areas not only insures greater biophysical diversity (due to movement of pollinators and seed dispersers) but also creates opportunities for regenerating a larger, connected network of healthy public open space (Rottle and Yocom, 2010: 66). By connecting isolated landscape patches with these corridors it will not only facilitate movement of insects, birds and small mammals but also people and water.

In order to integrate everyday life of a community with nature, sustainable practices should be encouraged. These practices should also better the lives of the community and offer more economic alternatives. Sustainable systems such as biogas converters, solar power geysers, permeable paving and rainwater harvesting are proposed to be used in Fort West. These systems not only save energy costs, but again make processes visible that can have an educational and value system influence on an everyday basis.

Ecological accounting

Tracing the environmental impacts of a proposed design will ensure that the economic capital (productive landscape) established on the site will not adversely affect the natural capital. The design realization of this can be achieved through informing and accounting.

In order to make good design decisions that reflect the overall ecological costs and ultimately informing the design process, a material comparison table was done. This provides an understanding of the impacts incurred during a material's entire life-cycle, from extraction

through to manufacturing, use and eventual recycling or discard. Materials that are sensitive to the character of the site, easily available, could be sourced locally, potentially recyclable or made from recycled materials and have a low embodied energy, were chosen. The maintenance requirement of each material was also taken into account. Therefore the main materials chosen were exposed glass aggregate concrete paving, clay brick pavers, precast concrete grass blocks, red clay bricks, reclaimed eucalyptus timber and gravel.

Sustainable Sites Initiative (SSI) is an interdisciplinary effort by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Centre at University of Texas, Austin, and the United States Botanic Garden, to develop a sustainability rating system for landscapes (similar to Green Star for buildings) that works to transform land development and management practices (SSI 2009). An SSI was done in order to account for the design's environmental implications (figure 22). The SSI was an ongoing process that was used to test the acceptability and impact of a design decision. According to this way of rating ecological accounting, the project achieved a four star rating, which is the highest rating.

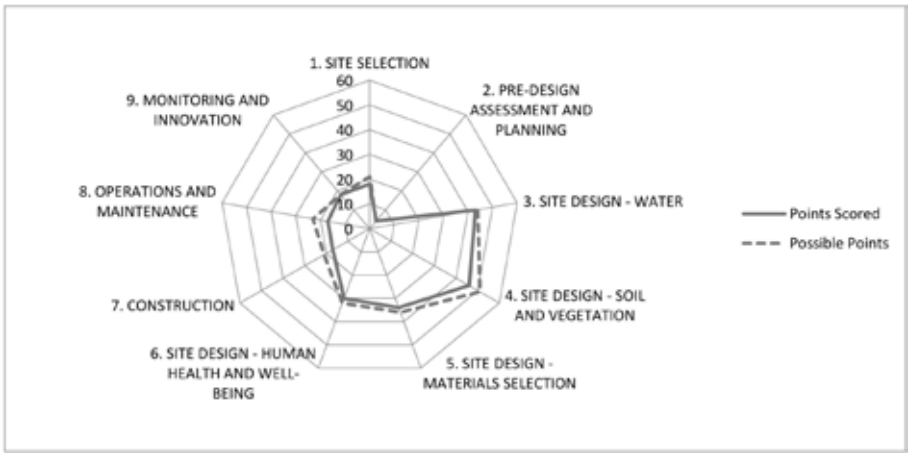

Figure 22
Sustainable Sites Initiative graph for Fort West
(illustration graph: Grunewald, 2012).

In conclusion the approach, as seen in the CLMM, matches biological diversity with cultural diversity rather than compromising both the way conventional solutions do. It now appears clear that the maintenance of a healthy society requires not only a healthy economy but also a well-conserved natural system. The CLMM could be used to create new strategies for achieving healthy societies and economies. An intensive site analysis of Fort West (see Grunewald 2012) indicated that the site has the potential to be re-engaged with the degraded cultural landscape in order to establish social and ecological health through the application of the above mentioned guidelines.

Hope for Fort West

Over the years proposals have been put forward for the development of this degraded cultural landscape. Some have wanted to develop the land for estate housing, others to turn it into a museum, while one even wanted to turn it into a Hollywood set. However, all these development proposals have fallen through either due to lack of finances, fraud or more commonly lack of involvement with the community (past and present). Fortunately there are positive prospects for the future of the area. The development of the greater "Fort West self-sustainable urban village"

has been identified as a Special Mayoral Development. The idea is to redevelop the historical Fort West village, into a new residential, self-sustainable township (SEC 2012: 27). Therefore the Tshwane Metro commissioned the Fort West Urban Development Framework for Phase 1 of the project, completed 2010, it will mainly contain new housing opportunities (see Grunewald 2012). This paper dealt specifically with the development of Phase 2 which contains the historic village premises.

The situation at Fort West village might seem too challenging and the design guidelines proposed by this paper idealistic, yet they were formulated in response to potential found on site that can be tapped into in order to regenerate this cultural landscape (solutions grown from place). Through an interview with the non-profit organization, the NEA Foundation, much more potential was discovered (*nea* is a Swahili word meaning 'purpose'). The NEA Foundation is the only organization currently involved with the community of Fort West. They first got involved with a small existing crèche at Fort West, that was started by a Fort West resident to address the lack of preschool education (interview with van Vuuren 2012). The former stables have been converted to house the children who are cared for by women of the Fort West community. Through their involvement with the crèche the NEA Foundation has slowly but surely got involved in other aspects of community life. In 2011 the NEA Foundation was approached by the women of Fort West who asked if they would help them set up a skills development workshop. The first workshop was held early in 2012. The ladies were taught how to print material. Through the success of this workshop the ladies have been employed by a local designer to print material for her. This then also led to another workshop that was held to teach the ladies how to sew. The profits from the sales of both the material printing and sewing work are then divided amongst these women. These profits are mainly used to pay for their children's school fees (interview with van Vuuren 2012).

Community life at Fort West is regulated by the Fort West Community Forum (FWCF), which was set up by the community for the protection of the commune as well as the heritage of Fort West. The FWCF holds monthly meetings in the octagonal Dutch Reformed Church (NG Kerk) which functions as both a church and a community centre. The FWCF also limits the addition of structures to the existing historic buildings (interview with van Vuuren 2012). In the community's limited capacity they are already trying to take control of their own future, as well as the future of Fort West. A small informal retail sector already exists in Fort West; these include small tuck shops, a fresh fruit and vegetable store, a car wash, and a basic *chesa nyama* (local meat shop and eatery). There is also a group of men who collect recyclable materials and a small group of ladies that weave mats from the recycled plastic bags collected. The NEA Foundation is looking at expanding both of these sectors (interview with van Vuuren 2012).

Concluding thoughts

Fort West and the leprosy community have experienced a painful history of rejection and isolation. Communities were created through the common bond of this history. However, through the advancement of medical knowledge these communities suddenly ceased to exist, or did they? The current informal settler community illustrates how even though leprosy is no longer an issue there are other social concerns that have resulted in the formation of a new kind of segregated community. Both the historical and the current narrative of the site, lends it meaning as a place of refuge and hope.

The human needs for cultural belonging, contact with nature and connection with place are often not met by basic infrastructural projects. In the case of Fort West, this need not be the case. The past can be a possible way to aid social and ecological healing for the future community. We would thus like to speculate with Hull, Lam and Vigo (1993: 118) that place identity can be causally linked to human health, sense of community and a sense of connectedness. Throughout this paper it is accordingly proposed that by acknowledging the past for the development of the future, communities may be connected back to nature through actions that can reveal processes and thereby instil values, ultimately regenerating meaning and identity of place and people. The concepts contained in the model presented in this paper can be used to guide the convergence of environmental, technological and socioeconomic processes to produce liveable and sustainable environments.

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