

Waste as Infrastructure *Emergence of productive public space*

STUDY CASE

Twenty-two years after the end of apartheid, South Africa (SA) remains highly divided racially and economically. As a consequence of the Apartheid's social segregation, alongside a lack of available urban land due to population growth, several designated areas for relocating the "black/African" population were placed over sand dune wetlands in Cape Flats district (Anderson, 2013: 468). As a result, informal settlements -such as Lotus Park, Waterfront and Phola Park- experience seasonal flooding episodes. In this case study, the drainage system provided by the Lotus River canal - which runs across

the previously named settlements - is insufficient (Haferburg, 2002: 31) due to the consistent waste and silt obstructions (Bouchard, 2007: 4). This is the result of the residents disposing their waste in the streets, causing drainage blockages, flooding throughout the wet season and polluting the watercourse. The vulnerable reality of this area is debilitated even further due to a deficiency of basic service infrastructure (Haferburg, 2003: 80), lack of safety (Crime Stats South Africa, 2015) and over 50% unemployment that continues to increase (South African Census, 2011 and Hanson, 2013).



CONNECTION BETWEEN PEOPLE AND THEIR ENVIRONMENT

The conception of recreational public space of the sort that characterises the formal city is not a priority in informal settlements, so it needs to be pushed to a notion of productive and service infrastructure. Existing routes demonstrate points of social meeting and needed connections in the area. These networks of trails were utilized to determine three significant crossings along the canal connecting adjacent townships and socially activating the wetland. In those intersections, the recognition of existing programs meet possible practices resulting from the restored river system. As a result, the following new public spaces are proposed: (1) waste infrastructure for rubbish management, (2) clean water sources and public toilets in response to the lack of basic services, and (3) community gardens enhancing urban agriculture in the area (Fig.2).

Possibilities for activating the wetland increase as a result of the direct interaction with the process of cleaning the water source. A programmatic structure along the watercourse facilitates job creation and enhances public education in terms of water usage. Crossings no longer simply link neighbourhoods, but become public space destinations for work and social meeting around water. Supervision of action around these points allows local community organisations and individuals to act as custodian over open space, facilitating safe movement between socially diverse neighbourhoods.

In the attempt to explore design strategies to shape a productive public space, the first watercourse crossing proposed in the master plan is explored in more detail (Fig.3). That is, (1) waste as infrastructure, configured as a hybrid space where productive and leisure uses coexist and intersect. This facilitates the emergence of a flexible public space shaped by social practices and their mutable actions over time (Fig.4).

*Master plan elaboration (Fig.2) in collaboration with Andrew James and Garret Lark.



Fig.3

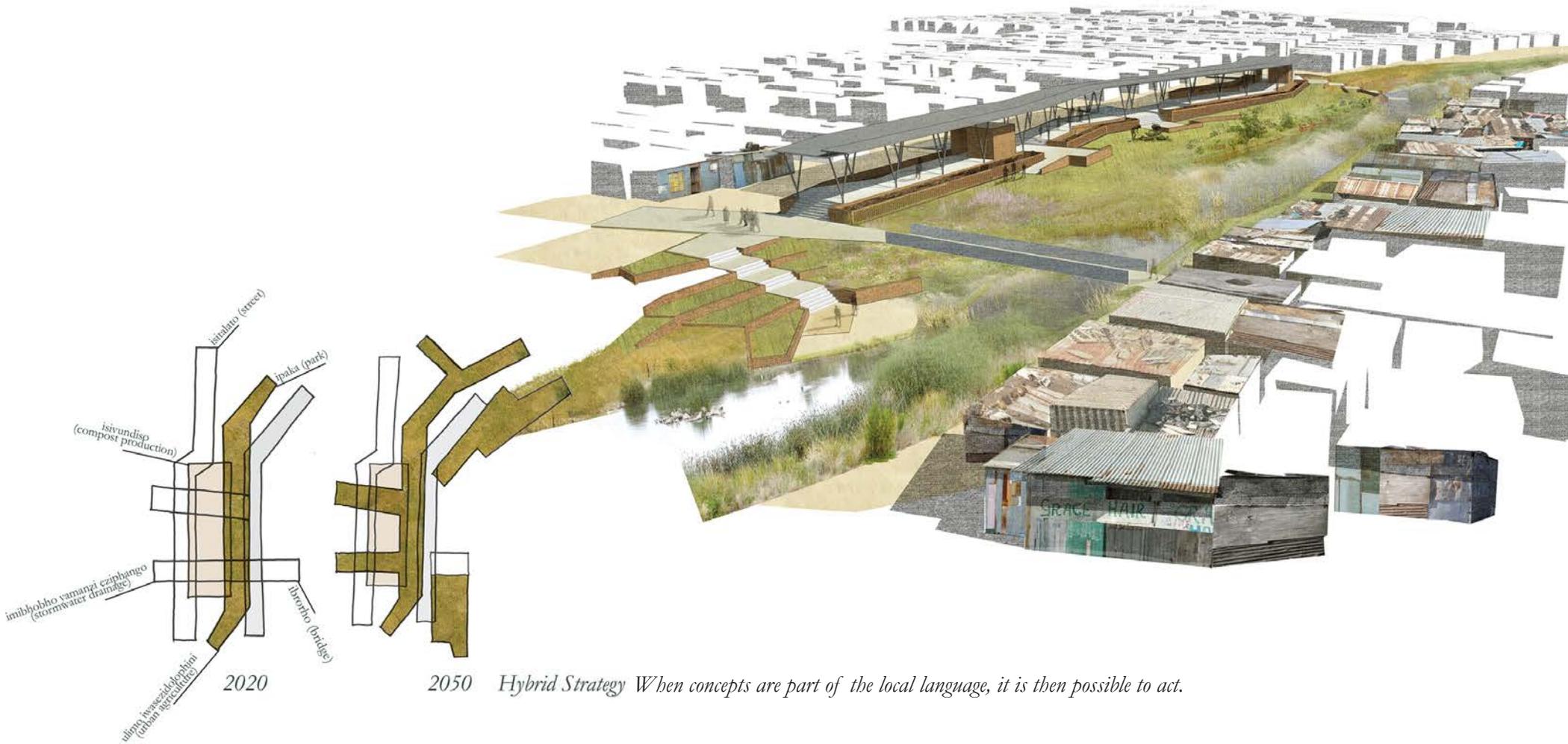


Fig.4
 Local landscape types translated to Xhosa language from:
 Environmental Resource Management, Xhosa version,
 City of Cape Town and Xhosa-English Dictionary.

ECOLOGICAL BENEFIT

Historically, natural landscape features and man-made infrastructures were used in SA as physical barriers to separate the population racially. However, hydrological boundaries - as concrete ditches - can be reshaped to become the opposite. That is, natural catchment ecologies conceived as public spaces to link disparate communities.

The intervention suggested in the Lotus River canal that runs across the Cape Flats informal settlements attempts to transform the existing concrete channel into a naturalized watercourse, leveraging the confluence of existing and ephemeral water bodies adjacent to the area. By this way it is feasible to create a high- biodiversity topology, which provides more capacity for storm-water retention, whilst treating contaminated water for its reuse in the informal settlements

and in agricultural and recreational purposes downstream. Innovation through water sensitive urban designs (WSUD) can contribute to social equality through the supply of basic services and green infrastructures, especially in informal settlements where a substantial proportion of individuals still do not have access to water sources or sanitation (UNICEF/WHO, 2015:7).

Considering that improperly managed waste is the cause of floods, a WSUD in this context has to be aligned to a refuse management project that reorganizes waste collection from the watercourse and from the settlement as a means to support environmental cleanup and employment opportunities. The inlet zone for the constructed wetland is then associated with the compost production (Fig.3). Rubbish-

traps and sedimentation ponds are proposed to reduce the inflow velocity and retain its silt and waste. Then, a shallow area is defined for organic waste collection that can be composted within the settlement. After these features, a multiple sequences of macrophyte zones, extensively vegetated and with various depths, will capture the water's finer pollutants providing recycled water for toilet facilities, community kitchens and laundries within the settlements, and community agriculture downstream.



Fig.5

SOCIAL BENEFIT

In the particular case of Cape Flats settlements, the high levels of unemployment and social cooperation could leverage as a resource to create a program that activates and maintains the use of the watercourse and public space (Fig.5).

Organic household waste, that corresponds to over 60% of refuse composition within low-income estates (Hoorweg and Bhada-Tata, 2012: 18), will be gathered and used for compost production. This process will be concurrently implemented within a shaded walkway facility that emerges as public space. By not placing a financial burden onto the municipality, compost production becomes an accessible way to empower residents to generate personal and community-based savings for the creation of a self-regulated public space. A program encourages the trade of organic waste collection and daily work involved in the compost production for tokens to lease plots of irrigated land. These plots correspond to the community gardens previously proposed within the wetland master plan, stimulating residents to crop and sell their own agriculture or gardening production. The resulted soil sacks from compost production will be sold in order to up-grade the informal settlement and also used to restore the river system through planting. This is a design-led approach creating collaboration towards an open-ended destination.

