Durban Case Study Analysis

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The city of Durban, a coastal city that runs 2,297 square kilometers, is located in South Africa's KwaZulu-natal province, and sits within the Maputo-Pondoland-Albany biodiversity hotspot. (Worldwatch Institute, 338) Durban's biodiversity hotspot is one of only 35 in the entire world. The city has a growing population of 3.4 million with a density of 1,49 inhabitants per square kilometer. (Institute, 337)

Like all cities on our planet Durban is subjected to the effects of climate variability. Since 2001, the city has had an increase in 660,000 residents, with a large percentage of those being affected by poverty. As global warming continues, the temperatures in Durban are predicted to increase by 1.5-2.5 degrees by 2065 and 3-4 degrees by 2100. (Institute, 338) Additionally, further projections signify that there will be an increase in aggressive and intensive rainfall by 2065, and up to 500 more millimeters of rainfall by 2100; which equates to 2.6 feet of rain per year. (Institute, 338) This will result in more frequent, severe, and dramatic storms and rainfall events, which leads to stronger stream flow intensity from the process of excess surface runoff. (Institute, 338) On top of extreme weather, Durban may also face rising ocean water levels, species extinctions, topsoil reduction or loss, vector-borne diseases, and potential reductions in agricultural yields (Institute, 338). To mitigate these climate change impacts, Durban must plan to implement reactive and proactive steps such as protective measures, accommodations, retreats, or avoidance of hazards.

Despite the need to adopt more sustainable practices, there are short-term political and development needs that divert attention from these long-term goals. Firstly, there is a lack of skilled human resources and finances needed to implement new measures. There are also ineffective links between community and government structures, preventing adequate assessments and responses to

community-level risk. This is foiling the ability of Durban to transition into a more adaptable and green economy. Despite these impediments, the city of Durban had implemented various sustainability practices to achieve the goal of becoming a sustainable city.

Participatory Governance

In 2004 the Municipal and City Adaptation Plan initiated a Citywide Municipal Climate Program (MCPP). The first step implemented focused on municipal adaptation, or actions that were linked to the key line functions of local governments. The second step was community-based adaptations, which were focused on improving the adaptive capacity of communities. The third and final step was the implementation of a series of urban management interventions. This targeted specific climate change challenges, such as the urban heat island effect, increased stormwater runoff, water conservation, and sea-level rise. All three components led to multiple projects focused on ecosystem adaptation and followed a "learning by doing" approach. For example, the MCPP would hire champions and educate them on sustainable practices and ideas. The champions were then sent back to their departments to educate their team members (eThekwini Municipality 2011).

Since the implementation of this program, Durban has worked on resolving its climate and sustainability issues. Out of the seven goals of sustainability, Durban has focused primarily on creating more prominent places for nature, building centers of wellbeing, people centered development and compacted and connected levels of development in regard to focusing on neighborhood scales. Currently, the MCPP has changed to the EPCPD, The Environmental Planning and Climate Protection Department, in 2009. This department is no longer controlled by a single individual and now employs 11 full time workers. It promotes sustainability as the core idea for all municipal and city departments. This jurisdiction now covers over 2290 square kilometers. The EPCPD program focuses on

the sustainable idea of participatory governance by creating educators to further educate lawmakers and municipal departments who then can share the message of sustainability to their residents.

A Prominent Place for nature and People Center of Development

The City of Durban's creation of more prominent places for nature coincided with the vision of establishing a more beautiful and ecologically enjoyable city. In 2008, during the lead-up to Durban's hosting of the 2010 FIFA World cup, the "Buffelsdraai Community Reforestation Initiative" was launched (Durban.gov n.d.). This initiative involved the revitalization of 521 hectares of land that previously was cleared for sugarcane cultivation. The Wildlife Conservation Trust trained residents from some of Durban's poorest and most vulnerable communities to become "Treepreneurs." Treepreneurs would collect native seeds from local forests, and replant them to replenish ecologically fragile forests. Since the launch of the Treepreneurs program, there has been a creation of 43 permanent jobs, 16 part-time jobs, and 349 temporary jobs for members of the Buffelsdraai and Osindisweni communities. Employed Treepreneurs would work and receive payment in the form of credit that can be exchanged at quarterly "trees stores". The credits could then be spent on items such as food, building materials, other pre ordered goods, or to cover school and education fees. The Treepreneur program has had early indicators suggesting that the direct socioeconomic impact on these communities have been very significant. Areas where the program took place have seen major Improvements in education and food security within the community.

An example of the Treepreneur program's success is the reforestation of the Inanda Mountain starting in 2009. This project covered 250 hectares of communal land on and around the mountain which had suffered previous damage from logging and wildfires. The reforestation project hired 76 Treepreneurs and created 46 local permanent jobs in the area. Since 2008 the project has planted over 800 thousand

trees, composed of 141 different native species (Durban.gov n.d.). This project targeted the removal of invasive plant species, and the replanting of native plant species. This model of reforestation prompted the development of Community Ecosystem-Based Adaption (CEBA). It promoted the relationship between human and nature and embodied the Treepreneurs core concepts thus providing more opportunities for disadvantaged and poorer residents. These opportunities included tree reforestation, propagation, alien plant removal, riparian bank restoration, recyclable materials collection, as well as several training opportunities for workers.

The city of Durban also put in place conservation measures upon areas to protect the biodiversity within the city and ensure more sustainable ecosystem services. One example is the Durban Metropolitan Open Space System (D'MOSS) that covers 75,000 hectares of open green space. This is made up of forests, wetlands, estuaries, grasslands, and woodlands within the city of Durban (Bux 2021). These areas for conservation also play a role in complimenting human-built infrastructure. Utilization of natural ecosystem infrastructure such as wetlands can be used to tame and lessen the effects of natural disasters, such as flooding. Wetlands would reduce the need for implementing more expensive man made storm water infrastructure, thus acting as a safety net against the effect of climate change on the local population. Between 2002 and 2015, D'MOSS acquired 591 hectares of land reported to be of high biodiversity value. Selected areas that were purchased from private owners were adjacent to existing nature reserves. This clever tactic maximized the ecological integrity of the landscape and further enhanced connectivity through the lengthening of green corridors. Currently D'MOSS covers over 94,000 hectares of land. This includes estuaries, forests, wetlands, grasslands and dry valley thickets. DMOSS acts like a carbon battery,, storing over 24.7 million tons of CO2. By aquiring and preserving large

swaths of nature, Durban can protect these green spaces for future generations, promoting a prominent place for nature.

Another tool Durban used to create sustainable measures was a “Special Rating Areas” system. Green spaces ranked as a special area were subject to an additional levy on property taxes. This money was collected and used to fund improved land management. For example, in 2009 a pilot project led by the Giba Gorge Environmental Precinct was established on 345 hectares of land. They would aim to control the invasive alien plant species in the area along with fire and pollution monitoring and management (Fire n.d.). the main goal was to protect vulnerable ecosystems and biodiversity from the damage of global warming and the increase in invasive species. The “Working for Ecosystem” program was initiated at the national level in 2006 and is now funded by the EPCPD. It employs and trains 185 people. The Working on Fire Program, set up 3 years later in 2009 has 43 staff members. It aims to alleviate poverty, develop skills to manage fires, and undertake invasive plant control with a focus on high biodiversity priority areas .

Creative Placemaking

In 2008 the city of Durban implemented a green roof pilot project atop of the city owned City Engineers complex. The city engineer complex green roof covers 550 square meters of land (Greenroofs.com 2022). The goal was to explore the benefits of green roofing in the city, such as reducing storm water runoff, bringing native plant and animal species back to the center, and lowering the roof and indoor temperature. The city of Durban ran several crop trials with some suggesting that green roofs could improve urban food security and encourage more local municipalities to implement green roofing as well.

Compacted and Connected Levels of Development

The City of Durban placed a heavy focus on sustainability on the neighborhood scale. This was done with the inclusion of Municipal Climate Protection programs that was delivered in the city's key strategic planning document. This aligned with the city's strategies for protections against climate change and hazard mitigation. In Durban there is a large link between ecological focused planning and municipal work. The citywide Municipal Climate Program (MCPP) in 2004, targeted issues such as the urban heat island effect, increased storm water runoff and other environmental hazards on the community scale. By creating municipal programs that support the implementation of environmental hazard protection, Durban is successfully linking their municipal goals with their ecological and sustainability goals.

In conclusion, the city of Durban meets five out of seven key elements of a sustainable city. Durban created a prominent place for nature by implementing conservation areas such as the protection of D'MOSS land, along with reforestation techniques. The city also met the criteria for people centered development through the creation of social programs such as the Treeprenuers and the participants in the Working on Fire program. The green roof pilot project was a successful trial and example of creative placemaking along with also reducing climate impacts such as the urban heat island effect, surface run off and other natural processes. Creation of D'MOSS land and the transit system checked off compacted and connected centers of development while finally, the MCPP, the EPCPD and the Durban Adaption charter promoted participatory governance within the city.

While the current protocols Durban has in place promote sustainability, there is ample room for improvement. The city of Durban, like most cities throughout the world, relies on fossil fuels to create the energy needed for buildings, homes and transportation. The city needs to have a larger focus on shifting towards clean energy to support these functions. Durban could also move towards becoming

carbon neutral. Durban lacks in focus on creative placemaking, and improvements should be made by the city. Green roofs provide aesthetic features while also serving a practical function. THe city could expand on this concept by possibly implementing green walls. While being visually appealing, these would also provide passive cooling, increase green space and aid with water retention within the city. Durban also needs to place a larger focus on community-based involvement. Many of their current programs such as the Treepreneur program could be used as a baseline for new projects. Expansion would lead to more job opportunities in the civil sector, improve society, and aid in protecting the environment. Currently, sustainable housing is not a huge point of interest in Durban. The government should focus on the poorer sections of the city. This could be done though investing more into local poorer communities, provide safer and more affordable shelter, along with retrofitting existing buildings to be more energy efficient. Sustainable and affordable housing is key to any sustainable city. While Durban has successfully implemented many social, environmental, and municipal programs, they still have space for more improvement in building an even greener and sustainable city.

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