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ECOLOGICAL SPACE IN URBAN COMMUNITIES

“Kingston as an Ecological Space”

Green Space



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A young registered architect in Jamaica with nine (9) years of experience now in the position as Architect Planner at the National Environment and Planning Agency and providing the agency with full architectural support in its review process of proposed developments within the country and also consultation with developers / applicants. In 2002 he received a scholarship from the Government of Jamaica, which gave him

the opportunity of studying Architecture in Cuba. This experience was both an academic and cultural feat combined. This promised to be quite an interesting experience, and by the end of the first academic year, gained a Diploma in Spanish Writing and Communications from the Universidad de Cienfuegos. It was then time to get 'down to business' between 2003-2008 pursued a Bachelors Degree in Architecture from the Universidad de Oriente. During my sojourn I also gained the award of 'Foreign Student of the year in Architecture'.

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ABSTRACT

The compounded effects of climate change, escalating population growth, increased land development, alongside socio-economic challenge expose weaknesses in Jamaica's urban communities, highlighting the vulnerabilities and emphasize the need for sustainable interventions towards a resilient future.

What if we designed a new city using an old one?

As the capital city of Jamaica: Kingston generates the most culture, technology and commerce alongside human development spatially. As the city grows, not all impacts of land use are properly accounted for in land use regulation, involving the persistent fragmentation and inequity of urban green spaces. Communities are in Protected Areas and Forest Reserves, with the entire city falling within a Watershed Management Unit. The relationship with the ecological space has become highly mediated and complex with limited appreciation for it all. It has been suggested that planners have abandoned the 'garden city' concept, with greater emphasis and favour on private green spaces and delineated subdivided open spaces.

This proposal will revisit the relationship between human and environment throughout urban communities with focus on identifying spatial patterns and layouts for proposed green spaces, infrastructure and networks. As the premier planning agency in the country, the National Environment and Planning Agency is tasked to create a framework and plans for orderly progressive development coupled with environmental management and establishing green standards; building the case for an urban green growth agenda. In acknowledging the impacts and drivers on communities throughout Kingston, it is necessary to look beyond how spaces are used, but instead how ecological spaces influence culture, movement, socio-economics, well-being and quality of life.

INTRODUCTION

Sustainable Development Goal 11 aims to 'make cities inclusive, safe, resilient and sustainable'. As the guiding framework for this paper, making Downtown not only the place to 'live, work and play' as outlined in the Vision 2030: National Development Plan for Jamaica, but also meet the targets outlined for Goal 11 is no small feat.

Cities are places of human development, both spatially and culturally; but also represent the excesses of human activity, encroaching upon and altering the natural environment. Cities as we know them are dramatically changing in their form, structure and use. Our living environments reshape how we live and use these spaces, presenting a new opportunity for us to reinvent and remake our cities in this new 'urban age' highlighting how well we plan, design and implement our living environments.

As the capital city of Jamaica, Kingston (with focus on Downtown) displays substantial amounts of infrastructural improvement and investment resurgence. Unfortunately, sustainable development, green space preservation, climate change mitigation and societal inclusion have been ignored by policy-makers and developers alike; with remnants of green spaces gradually encroached on and fragmented by a mixture of urban sprawl and neglect. These factors coupled with increased levels of air pollution have resulted in negative effects to human health.

Green infrastructure, transport and green spaces; components of ecologically sound spaces, play an important role in urban ecosystems and provide services with environmental, economic, aesthetic and recreational benefits. The World Health Organisation has highlighted that living conditions of an urban environment is the key to the health and well-being of its visitors and residents.

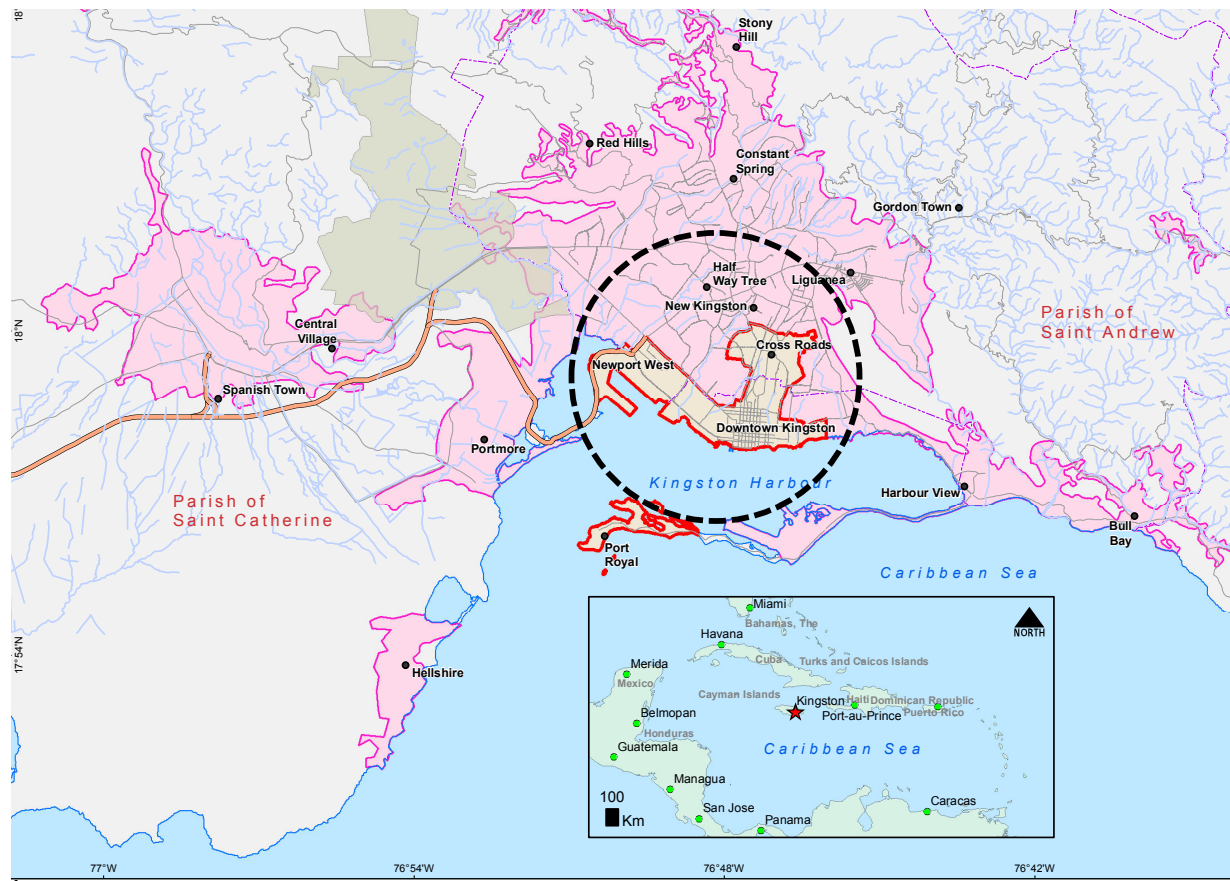
KINGSTON

Born out of a disaster in 1692; Kingston became a vital city rapidly out distancing Spanish Town, as the cultural, economic and government hub of the Caribbean. It was the most active growth centre for both private and public investment, job creation and economic development in the Kingston Metropolitan Area.

Kingston became a parish in 1713, growing from a seaside town to a city awash with houses, commercial entities, a natural harbor, massive defenses and a wharf fostering trade and gaining recognition as the great port of the Caribbean.

On the surface, the issues of Downtown, Kingston are prototypical of problems spanning other historic cities. Rapid population growth, influx of low income groups, overloaded services, declining investment opportunities, rise in unemployment, surge in criminal activities, limited financial and technical resources to allow for suitable rehabilitation of the building stock and the dynamics of modern needs and expectations are the symptoms to the sickness Downtown experiences. The birth of New Kingston and suburban townships, coupled with festering crime led to migration from the city and an onset of informal settlements.

Throughout its evolution, Downtown has remained as the centre of commerce and trade; entrenched in retail activities, cultural representation and constant sale of agricultural produce. Notwithstanding, the revitalization of Downtown has gained precedence with opportunities for exponential growth, investment and redevelopment plans aimed at developing commercial districts and residential complexes targeting all income groups.



1 Map illustrating the boundaries of Kingston

KINGSTON AS AN ECOLOGICAL SPACE

Spaces Working Harder

Urban Green Spaces

Urban green spaces stand to supply Downtown, Kingston with ecosystem services ranging from the introduction of varied biodiversity to the regulation of urban climate. When compared to rural areas; the air temperature, wind speed, relative humidity and solar radiation varies significantly due to the nature of the built environment within the city. Urban heat island effect is increased due to large areas of heat absorbing surfaces, combined with energy use and industrial output. To curb the effects of the increase in urban temperature, adequate vegetation throughout the city and management of water bodies will mitigate the impending situation.

To create Downtown within a garden, we face a practical limit on how many green spaces it may contain. It is important to maintain focus on green spaces that are open to the use of the public, particularly when we consider universal access for all residents; regardless of socio-economic standing.

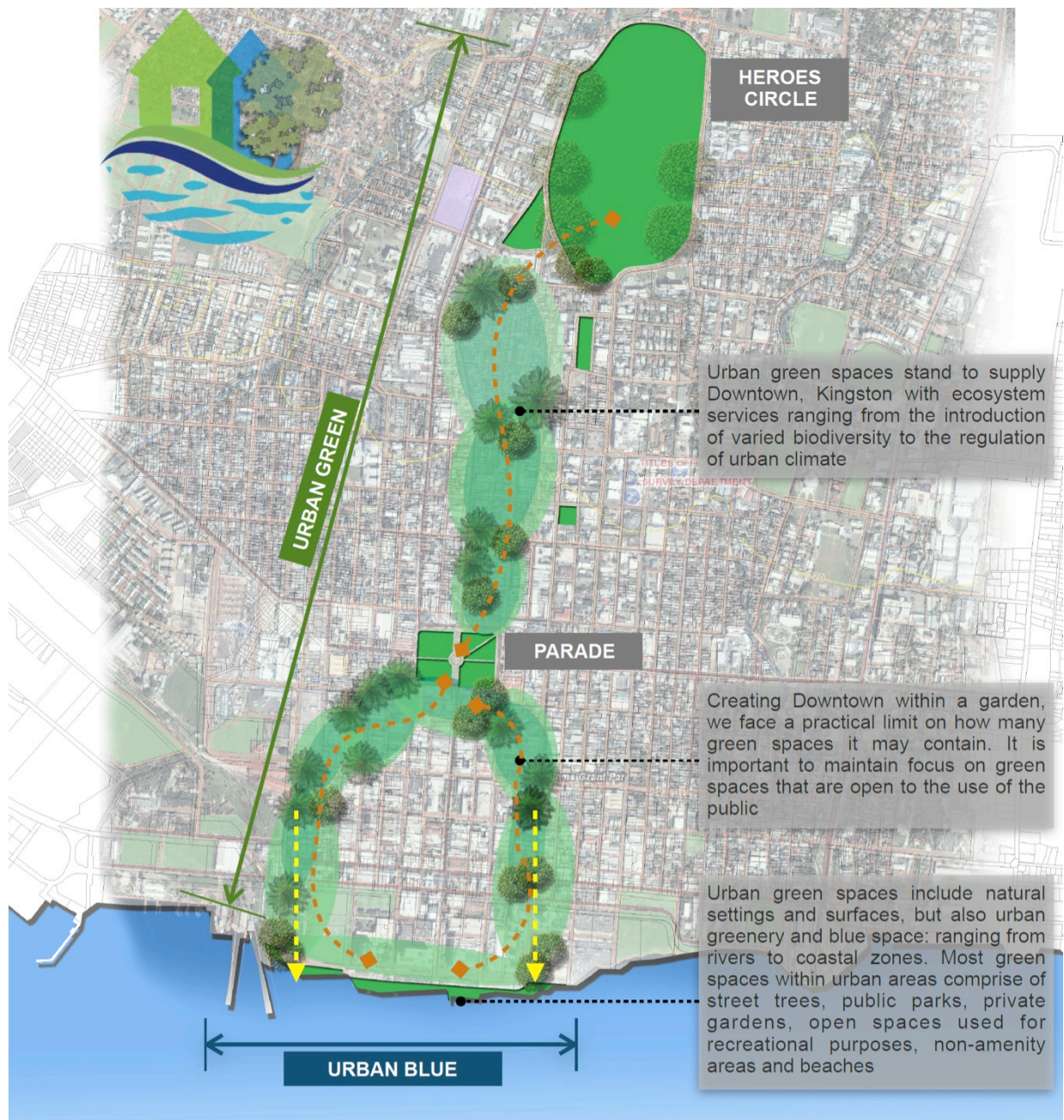
Urban green spaces include natural settings and surfaces, but also urban greenery and blue space: ranging from rivers to coastal zones. Most green spaces within urban areas comprise of street trees, public parks, private gardens, open spaces used for recreational purposes, non-amenity areas and beaches. Adopting the strategy of 'pervasive greenery', meaning greenery is inserted wherever it can be seen, used and maintained- be it a pavement, rooftop, façade, driveway or road divider; the idea is to cloak Downtown with green wherever proves feasible. The introduction of various used and proven methods to soften concrete structures, will eliminate the use of predominantly horizontal green spaces in an area which proves land scarce. Consider the application of green roofs, greening of vertical walls, rooftop gardens and landscaped balconies. By creating tiers of visible greenery from ground level upwards, we introduce opportunities for high- rise structures that form the cityscape as a means rather than impediment.

Downtown being a fairly built up city, requires creativity in the use and creation of green spaces. Dormant spaces are a luxury we cannot afford to lose. By targeting these forgotten or unused spaces, we redefine what is considered usable and increase land availability by creating multiple uses and users. Looking to green spaces on the ground level of buildings and subterranean levels accessible to the public for recreational purposes and walkways connecting buildings; or rooftop gardens that offer breathtaking views of the city attracting tourists.

Community green spaces are to be made accessible to the whole community. These spaces, within low-income communities of Downtown, enable involvement in the natural environment, enhance community inclusion, raise awareness of environmental issues and involvement in the natural environment. In a populated city such as Downtown, Kingston chances are that one will find people with shared common interests, allowing for the development of informal interest- based communities, where proximity to spaces is advantageous. Inclusiveness fosters cohesion and understanding amongst demographically diverse groups spanning throughout Downtown. Green spaces increase the opportunities for interaction between these groups.

Urban Blue Spaces

Bodies of water are usually excluded from the definition of urban green areas, but we recognize that water is part of the green space and that water edge is often an attractive feature used for the enjoyment of visitors and residents; whether along a river, cliff or sea beach. Downtown's location along the waterfront affords us the use of this working definition for urban green spaces by including 'Blue' spaces and where the riparian zone in its access to water is valued. The transformation of Downtown's waterfront into lifestyle spaces for public use gives options to residents and visitors seeking a break from glass and concrete. Urban blue space is increasingly valued by cities as a genre of public space for its symbiotic, experiential and economic attributes; essential to sustainable development. Downtown's waterfront is one of the most impressive urban-marine interfaces in the country. The ecological imperative to do justice to this setting is intense and long overdue. Vehicular use in this area has led to disjointed pedestrian connections between this physical barrier and the greater grid of the city.



Connecting Heroes Circle; slated to become the Government hub for the country and Parade which continues to be the major retail centre for the island (producers and consumers alike) to the waterfront through green, blue and grey networks improves the spatial, social and synergistic character of how these heavily used spaces are traversed. By connecting these spaces, we open the area to a change in urban form. So rather than viewing Downtown as a single, discrete entity it is more useful to think of it as interacting layers of different physical features with no distinct breaks or separation creating a flow from seascape to streetscape.

Urban Green Spaces and Your Health

Increased access to urban green spaces produces health benefits through various mechanisms leading to health effects, some of which have a synergistic effect. Various models have been proposed in the hopes of explaining the observed relationship between green spaces and health. Hartig et al. (2014) suggests four principal and interacting pathways by which green spaces contribute to health: enhanced physical activities, social cohesion, stress reduction and improved air quality.

Despite growing research in urban green spaces and the impact on health, there is comparatively low evidence validating differential health benefits with characteristics of green space. Varied configurations of green space, topographical features and built environment offer different opportunities for physical activities and mental restoration, based on one's age, individual preferences and gender. An urban green space has qualities that offer different opportunities for relaxation, engagement with the natural environment, play, physical exercise or getting away from unpleasant aspects of the urban environment; such as noise and heat (Wheeler et al., 2015). Attributes of green spaces, such as safety, amenities, maintenance, aesthetics and proximity are important for supporting physical activity. The size of green spaces is likely to encourage the types of activity people undertake. Sugiyama et al. (2010) suggests the attractiveness of a space and the options for activity provided is more relevant than the number of green spaces available. The European Commission (European Union, 2015) called for attention to ensure sustainable urbanization through the promotion of nature-based solutions, including provision of accessible green spaces. Co-benefits of investment in green spaces for Downtown includes enhanced economic competitiveness of the city, where quality of life is important for attracting and retaining a skilled workforce, an attractive and usable environment near residential areas will likely increase the value of properties creating livable urban areas, attracting new investment and facilitating the upkeep of the spaces supporting healthier residents and workforce.

Safe Spaces

Designing and initiating safe ecological spaces derives from an urban design and space management viewpoint. As Downtown becomes denser, visual access to spaces needs to be preserved. Creating a zone of influence and ownership is a principle of 'defensible space', where a group uses a facility feels that it 'owns' said grounds, thus protecting it indirectly through regular occupation and surveillance. Connecting spaces with roadways or busy places allows for easier and effective surveillance of an area. Spaces designed with a system of nodes and channels are punctuated by active areas, in the hopes of stimulating continuous movement, adding to safety measures.

Crime Prevention through Environmental Design (CPTED) asserts communities to play a greater role in protecting the community and themselves, by integrating the concept and principles into the design and management of the environment. CPTED promotes high quality and visually pleasing solutions as a response, aiming to enhance the legitimate use of spaces. Natural surveillance is achieved through numerous techniques where the flow of activities is channeled to place people near potential crime areas with the removal of obstructions, improving sight lines and keeping intruders under observation. The application of natural areas control requires greater care and approach on streets and areas open wholly to public use; for example: non-physical or psychological barriers in the form of paving textures, signs, nature strips or any form that announces the integrity and uniqueness of the area. Maintenance and management focuses on territorial reinforcement and the sense of 'pride of place'. Dilapidated areas of Downtown invite unwanted activities. Various planning and design strategies can be implemented to enhance security and combat such activities. Strategies can be categorized as follows (CPTED Guidebook 2003):

- Adequate lighting
- Minimize isolated and concealed routes
- Clear sight lines
- Use of activity generators
- Signage
- Sense of ownership
- Improve design of the built environment

Sustainable Transport

Sustainable Transport is sometimes known as Green Transport and it is any form of transport that does not use or rely on dwindling natural resources. It relies on renewable or regenerated energy rather than fossil fuels that have a finite life expectancy. Thus, having a low effect on the environment.

Green Modes of Transport

Greener transports in terms of energy- efficient public transportation systems reduce pollution and congestion, making the Downtown living experience less unpleasant and unhealthy. Encouraging residents and visitors alike to use public transport through the development of an extensive, integrated and affordable network comprised of buses and light rails that offer seamless connectivity is no small feat for Downtown; however, it is attainable. Cleaner forms of commuting and the availability of shaded pedestrian walkways incites pedestrians to undertake trips on foot, proving advantageous in the city's compact nature.



Introducing a network of solarized light rail hyper loops is a feasible option to support greener transport options and connect the city. Panels to power the system can be placed on rooftops, solar canopies, on bus/ train stops and even on the trains themselves.

Greening the Networks & Corridors

By connecting green spaces with ecological corridors to improve biodiversity, we thusly improve the urban landscape of Downtown. In the context of ecological corridors in the urban context differs from rural or natural settings where human presence is not predominant. Green corridors in the city contribute to the improvement of the urban environment while mitigating the effects of noise, temperature and air pollution. The corridors promote mobility and water infiltration by soft ways; with its existence providing alternative routes and increases the attractive potential of Downtown. The aim of green networks and corridors are to serve as a link to the greater developed spaces, improving the circulation profile for walking and less vehicular use. Swathes of green space between buildings provide a spacious feeling, relief from concrete structures and makes the city appear less overwhelming. Green corridors are juxtaposed with low & high-rise buildings giving the illusion of a break between grey networks and harsh areas.

Prioritize Green Infrastructure

Greening Existing Buildings

A greater effort needs to be made throughout Downtown to reduce the amount of energy consumed by its buildings, with a vision to mitigate the urban heat island effect and reduce the area's carbon footprint through the encouragement of the development of 'green buildings'. New buildings should be held to a standard, stemming from the creation of certified rating platform and existing buildings encouraged to retrofit. As times change, the need for varied forms of spaces weakens. The types of buildings abandoned in Downtown include commercial, industrial, residential and institutional structures. Introducing the concept of adaptive reuse ensures the focus today is shifted to 'greening' existing older derelict buildings. Introducing the concept of adaptive reuse, the real focus today has shifted to 'greening' existing older derelict buildings. An amalgamation of uses occurs when adaptive reuse is introduced, creating a vibrant atmosphere and livable environment. If done properly, it will ensure the buildings will serve new functions but remain true to the essence and style of the city. The process of reutilizing a building allows culturally and historically important buildings to be redeveloped and repurposed; which is different from retrofitting or 'facadism' that alters the façade and structure of a building. By reusing an existing building, we lessen the energy required to create these structures and lower the material waste from destroying and rebuilding these sites. The repurposing of existing buildings in the city contributes to sustainability, as these structures are made from high quality materials (brick, stone, slate and masonry) with numerous years left in their life cycle. Building reuse retains historic resources and character by providing a link between historical, present and future use. One of the main environmental benefits of retaining and reusing the existing buildings throughout the city is the retention of the 'embodied energy'; as the acquisition of resources, materials and equipment is limited making the project sustainable than new construction.

Green Boundaries

Downtown's interspersed high and low buildings create a skyline with character, reducing the sense of existing in a crowded space. The existing grid layout of the city will require unconventional intervention placing green boundaries around communities and swathes of green space between buildings, providing a more spacious feeling, relief from concrete structures and making the city appear less overwhelming. Through Downtown's grid planning, low rise blocks and green spaces are juxtaposed with high-rise buildings giving the illusion of space, making the environment feel less harsh, reducing the sense of congestion making living comfortable. Insertion of spaces of relief; such as green parks, in between the high-rise developments provide a recreational space and a respite from the built-up environment.

Sponge City



A "Sponge city" refers to a city where its urban underground water system operates like a sponge to absorb, store, leak and purify rainwater, and release it for reuse when necessary.

The Sponge City concept indicates how a city could be functioning as a sponge that has great resilience to environmental challenges and natural disasters. The optimal goals of the Sponge City are that the storm water generated from rainfall events could be absorbed, stored, infiltrated and cleaned with natural and/or manmade facilities. The rainfall and storm water could then be transformed into water resources that could be utilized during drought periods.

Having properly implemented the Sponge City concept in Downtown, it is expected that there will be a reduction in the recurrence and severity of floods, settling of water, improved water quality, allow the city to use less water per person, improvement in movement of traffic (limited water collected on roadways during and after rainfall) and controlled storm water overflow in connection with green areas. These green areas may become

retention basins for the times of flooding whereas otherwise they are used as playgrounds and recreational areas; which therefore has a positive effect on the heat island phenomena, improve quality of life and air quality. The use of green roofs, green walls and wetlands will be a key part of how the city adapts to climate change. Vegetation and soil will absorb water keeping it in the city and as the space heats up, the water evaporates, cooling the city. A garden on every roof helps to clean Downtown; by absorbing excess water and carbon dioxide.

Development of this nature is a change from the traditional approach or lack thereof displayed presently. Downtown Kingston as a sponge city promotes sustainable city construction so that the area develops a resilience to adapt to climate change, avoid and reduce disaster influence of extreme rainfall and serve a greater ecological function.

Six Priorities for the creation of a Sponge City

1. Adopt an integrated, whole-system thinking approach- Not only about recycling rain water or even simply preventing floods. It must achieve the goal of protecting water environments, resources, ecology and security all at the same time
2. Establish locally based laws and regulations- Changing the base model and needing the support of law. Who will oversee making and enforcing these regulations? Local or central government?
3. Promote coordinated cooperation between city departments- Effective implementation being essential to the coordination between agencies & departments (examples but not limited to National Water Commission, Water Resource Authority & National Environment and Planning Agency)
4. Find Innovative ways to raise financial resources at the city level- Identify various economic strategies concerning varied natural conditions and economic situations from interested investors and partners both locally and internationally
5. Tailor the design to local conditions and regional potential- An assessment of Downtown's condition and potential should form the base of any intervention by carefully assessing specific problems, leverage the local potential, specific areas and regional resources
6. Improve international dialogue and exchange of best practices: "foreign stones may serve to polish domestic jade"- An open dialogue and exchange of solutions across cities worldwide is essential to accelerating the transition & spreading of solutions

CONCLUSION

The concept of sustainable urban green development in urban renewal practices will reignite local environmental improvement measures and revitalisation activities. The integrated measures mentioned throughout the document stand to build a better ecological space throughout the city of Downtown Kingston by efficiently handling the convergence between ecosystems, spaces, land use and society.

The introduction of Ecological Spaces in the Downtown area will reduce fragmentation; increase the complexity of green space and landscape connectivity. These spaces improve the quality of not only the environment, but also social interaction and health benefits. Building an eco-space within the old city of Downtown creates appropriate green public spaces, controls the density of buildings, ensures the proper handling of the convergence between ecosystems of old and new areas of the city, connects the city and improves the quality of air and water.



BIBLIOGRAPHY

American Planning Association. 2006. Planning and Urban Design Standards. John Wiley and Sons, INC.

Downtown Ephrata, INC. 2004. Downtown Revitalization: A Resource Book for Downtown Ephrata.

Environmental, Development and Sustainability. 2003. 5 (3/4): 461-76

Government of Canada. 1996. Towards Sustainable Transportation. OECD Proceedings.

Government of Singapore. 2003. Crime Prevention Through Environmental Design Guidebook. Irrawaddy, Singapore.

Groff, E. and McCord, E. 2012. The Role of Neighborhood Parks as Crime Generators. Security Journal, 1-24

Hartig, T., Mitchell, R., DeVries, S. and Frumkin, H. 2014. Nature and Health. Annual Review of Public Health, 35, 207-228

Hayward, Tim. 2013. Ecological Space: the Concept and its Ethical Significance. Just World Institute Working Paper series no. 2013/02. Edinburgh

Kingston Parish Development Committee. 2006. Kingston and St. Andrew Sustainable Development Plan.

Sugiyama, T., Francis, J., Middleton, N. J., Owen, N. & Giles-Corti, B. 2010. Association between Recreational Walking, Attractiveness and Proximity to Open Spaces. American Journal of Public Health. 100 1752-1757.

United Nations Department of Economic and Social Affairs. 2014. Open Working Group Proposal for Sustainable Development Goals (Online). Available at: <https://sustainabledevelopment.un.org/sdgsproposal.html>

Wachter, S.M. & Bucchianari, G.W. 2008. What is a Tree Worth? Green City Strategies, Signaling and Housing Prices. 36, 213-239

Wheeler, B., Covell, R., Higgins, S., White, M., Alcock, I., Osborne, N., Husk, K., Sabel, C. & Depledge, M. 2015. Beyond Green Spaces: Eco Study of Population General Health and Indicators of Natural Environment Type and Quality. International Journal of Health Geographics.

White, M., Smith, A., Humphries, K., Pahl, S., Smelling, D. & Depledge, M. 2010. Blue Space: The Importance of Water for Preference, Affect and Restorativeness ratings of Natural and Built Scenes. Journal of Environmental Psychology. 30, 482-493.

Whitford, V.; Ennos, A.R.; Handley, J. 2001. City form and Natural Process- Indicators for the ecological performance of urban areas and their application to Merseyside, UK. Landsc Urban Plan. 57, 91-103A

Zhou, W.L.; Wang, Y.C. 2011. Spatial temporal dynamics of Urban Green Space in response to rapid urbanization and greening policies. Landsc Urban Plan. 100, 268-277.

International programs, reports, policy and legislation reviewed in the production of the paper:

- United Nations Sustainable Development Goals
- The New Urban Agenda