

UN-HABITAT IN THE WORLD

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UN-Habitat is present in at least **30 developing countries** through a network of Habitat Program Managers (HPMs), Chief Technical Advisors (CTAs) and project staff.





55%
of popul.

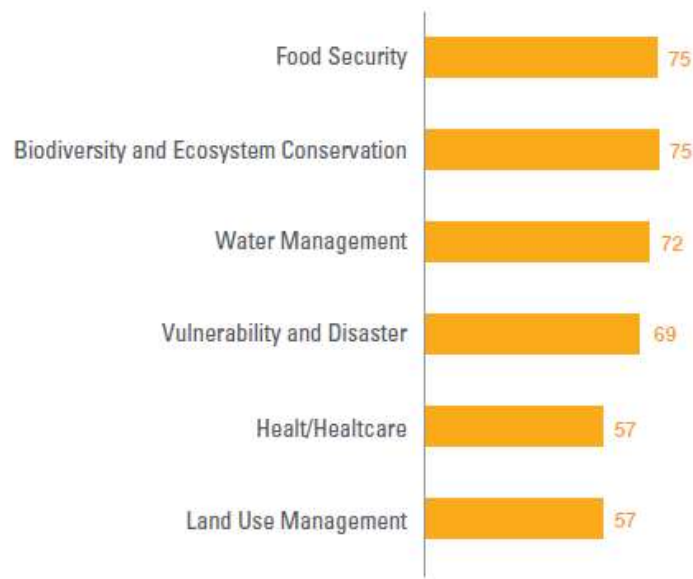
70%
resources

80%
Of GDP

75%
of GHG

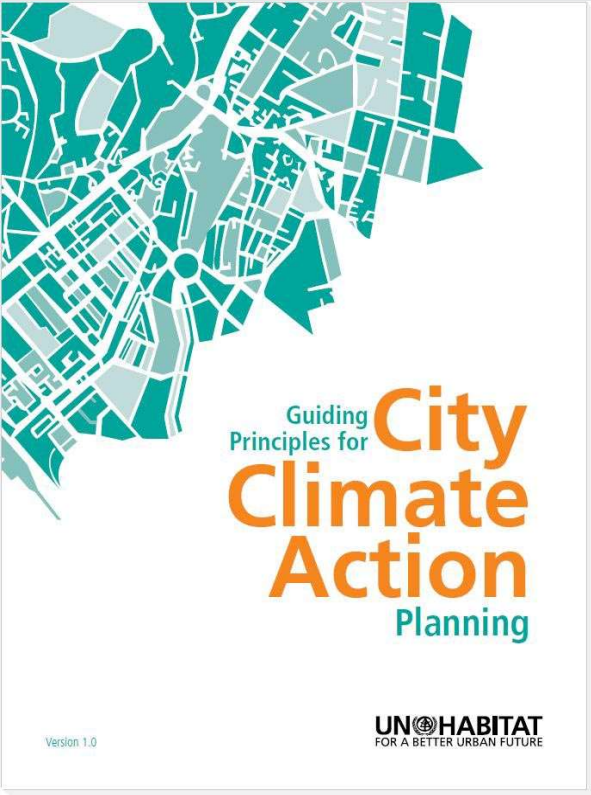


Figure 3: Adaptation Priorities



UN-Habitat work on Climate Change

Knowledge Management, Advocacy & Tools



Technical Cooperation, Demonstration Projects & Capacity Development

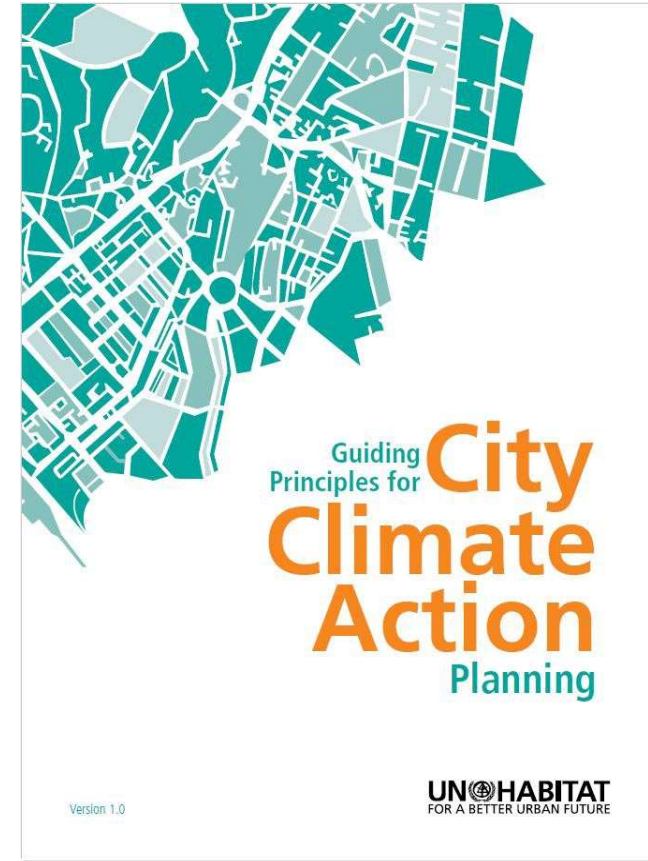


Partnerships and Networking



Cities and Climate Change Initiative

- Enhancing Climate Change national-local policy dialogues
- Developing tools for awareness, education & capacity building to support Climate Change strategies
- Mobilizing and promoting Climate Change networks to stimulate learning, knowledge sharing
- Assessing conditions, vulnerability and emissions, identifying challenges and opportunities for cities
- Supporting cities by designing innovative adaptation and mitigation pilot initiatives



APPROACH:

Seeking solutions with multiple benefits

Integrated in planning and management

Multiple scales: territorial systems; city-wide; neighbourhood; site

INCLUDES

- Ecosystem-based adaptation
- Resilience of urban systems (governance, capacities)
- Good planning principles for extension and redevelopment

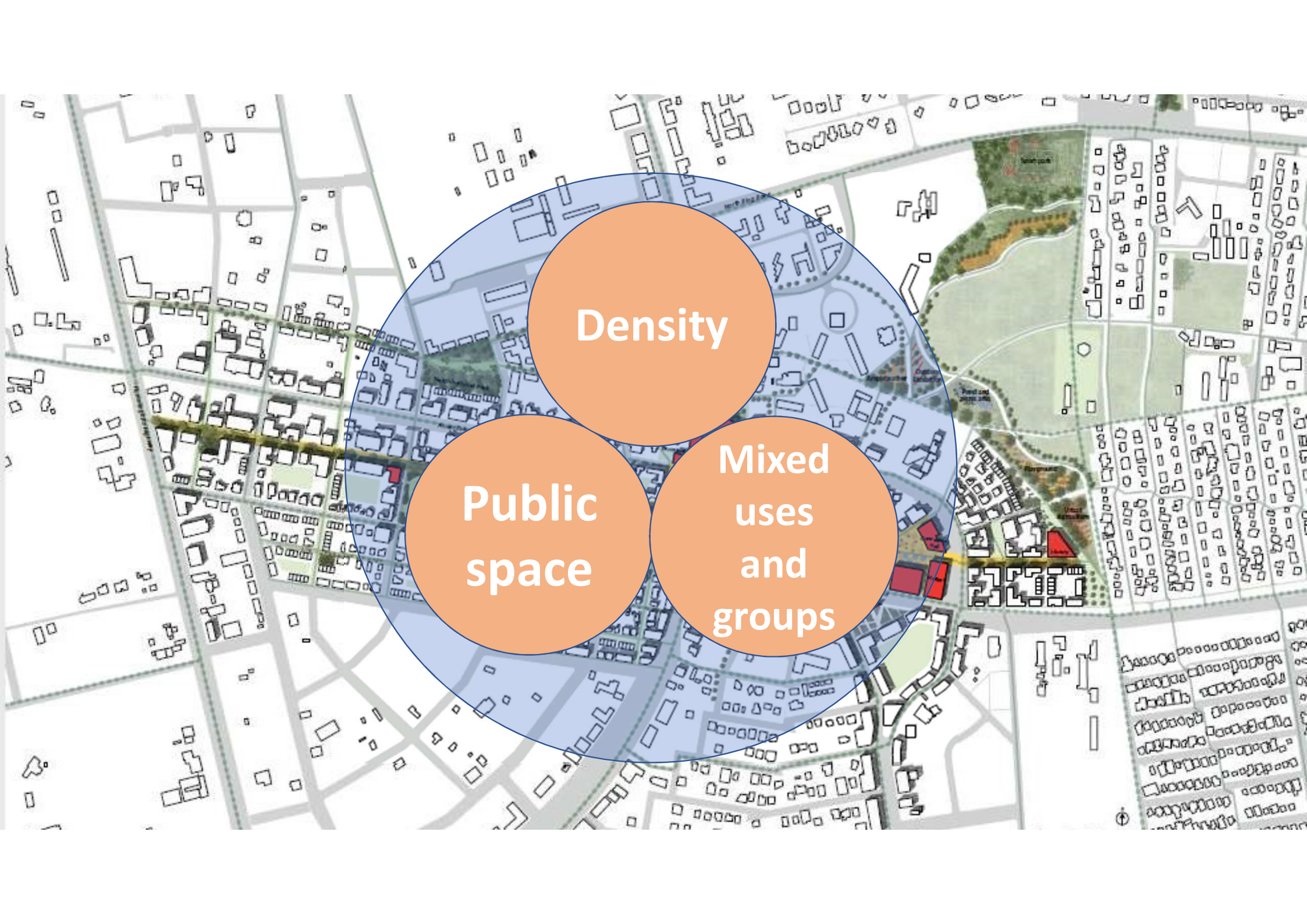
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Density

Public
space

Mixed
uses
and
groups

Belmopan, Belize – Urban Retrofitting

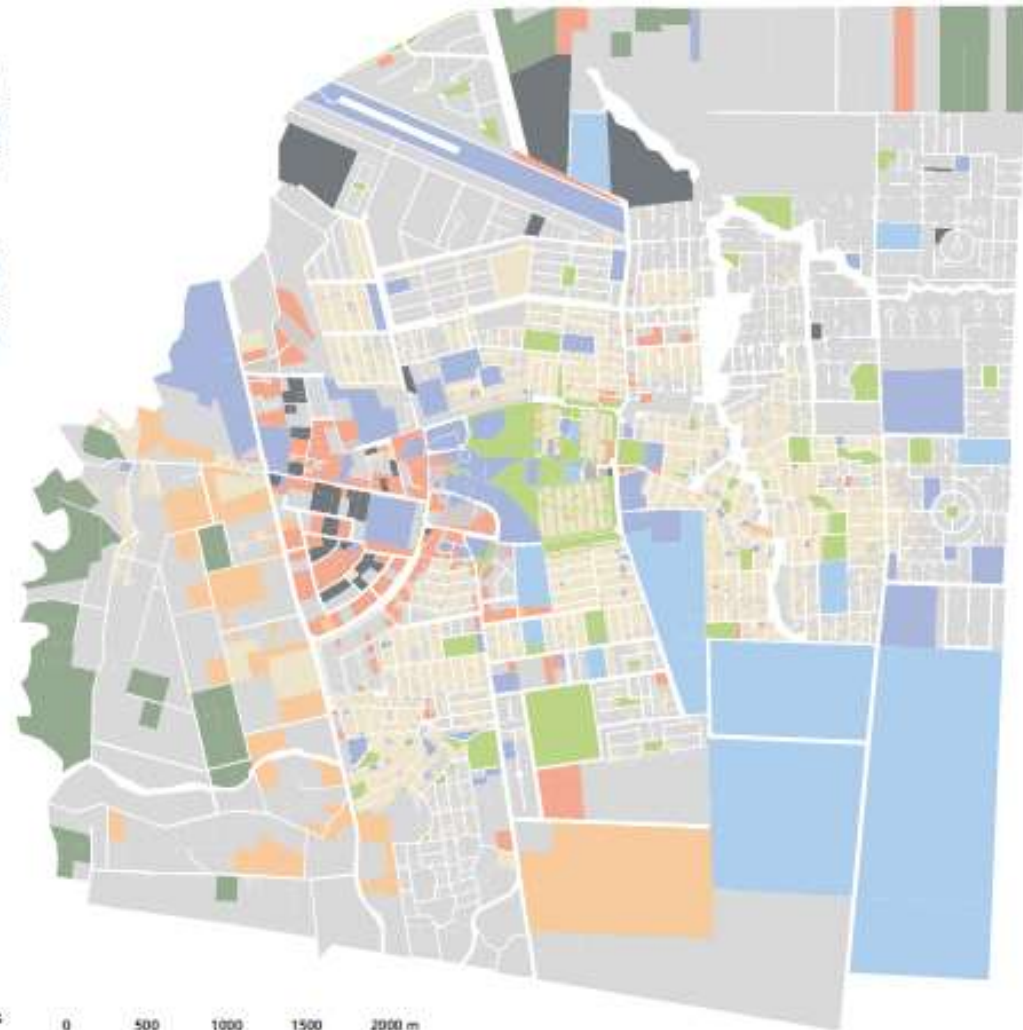
LAND USE

Currently, there is no downtown in the strict sense. Commercial uses are primarily concentrated in the central part of the city around the bus terminal and the market. Most government buildings are also located in the central part of town. Big box commercial and light industrial uses can be found within the triangle formed by Forest Drive, the Hummingbird Highway and Constitution Drive. The remaining parts of town are primarily residential.

Based on the analysis of the land use map provided by the Lands and Surveys Department, there are 3,561 acres of vacant land in Belmopan, accounting for 44% of the current municipal area. This is a 'gross' figure that includes all vacant plots, as well as all the land that is being used for agriculture. Considerations limiting the suitability of this vacant land for development still need to be analyzed to come up with a 'net' vacant land figure.



"44%
of the land in
the current municipal area is
vacant"



Existing Land Use (Source Belmopan City Council)

Agriculture	Educational	Industrial	Public / Institutional	Utilities
Commercial	Green space	Mixed use	Residential	Vacant

Fig.25. Existing Land use plan

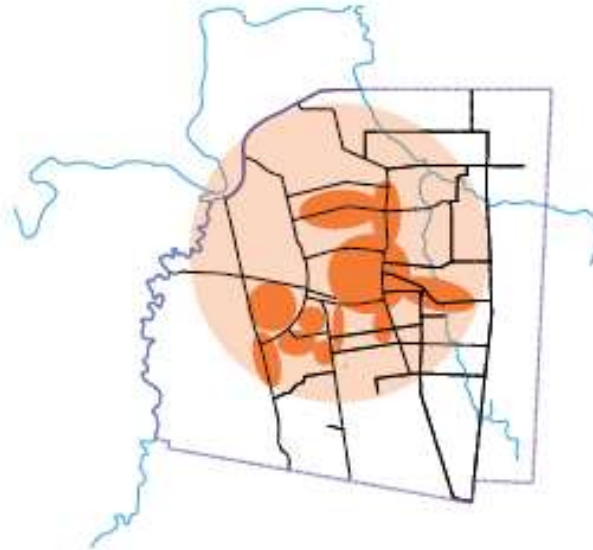
INFILL



Based on the analysis of the land use map provided by the Lands and Surveys Department, there are 3,561 acres of vacant land in Belmopan, accounting for 44% of the current municipal area. This is a 'gross' figure that includes all vacant plots, as well as all the land that is being used for agriculture.

It has been recognized the importance of infilling the suitable areas for construction in order to better define the urban structure and be efficient in the use of land and natural resources.

MIXED-DENSITIES

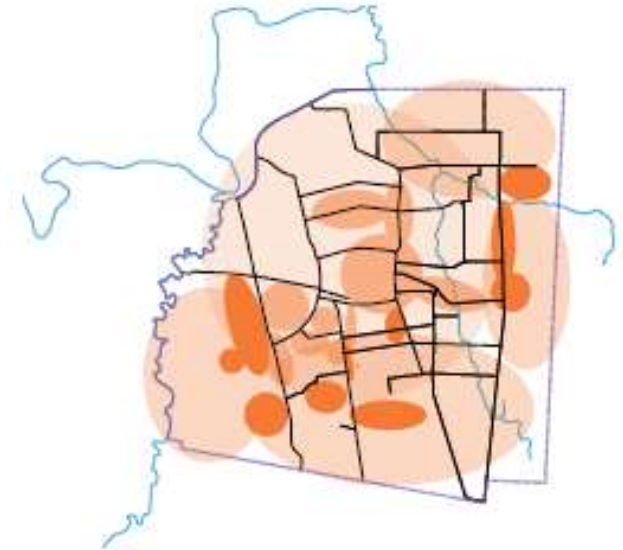


In order to be able to accommodate the current population growth without expanding unnecessarily or consuming excessive resources, we need to incorporate to the low density trend some high density development.

This would also promote a more vibrant, walkable and dynamic city through compactness generating more life in the streets, lowering infrastructure costs, making services more accessible and giving room to the need of new housing typologies.

■ High density
■ Low density

EXTENSIONS



This densification strategy would also need to be addressed in the new extensions development. That way the plan contemplates the existing city and the new areas from the same perspective, so that the city is developed as a whole with one same integrated vision.

■ High density
■ Low density

RIVERINE EROSION

Surrounded by a series of rivers, Belmopan is particularly susceptible to land loss due to riverine erosion. While it is unknown exactly how many feet of riverfront are lost per year in Belmopan, risk is primarily concentrated around the Mount Pleasant Creek area and Roaring Creek area. This is especially concerning considering the number of homesteads located directly along the listed creeks and rivers within the City.

DROUGHT AND HEAT WAVE

'Hot' days and 'hot' nights have increased significantly since 1960 in Belize, with the largest increase between June and August (September and November). Therefore droughts are not expected often. Daily mean temperatures usually vary between 24 and 28 Celsius throughout the year. During the dry season -February to May - high temperatures may cause incidental heat waves causing crop damage or health issues.



Fig.64. The first sketch of the Blue-Green network @UN-Habitat

BENEFIT CATEGORY	ADDED VALUE BENEFIT/METRIC	ADDED VALUE BENEFIT DESCRIPTION
SOCIAL	Recreation	New and improved park space, bicycle, and pedestrian trails, as well as community gathering and recreational spaces will give local populations and visitors a number of opportunities to participate in a variety of activities such as walking, jogging, bicycling, and playground use.
	Health	Regular exercise strongly influences an individual's health. Generally, people who are physically active live longer and are at lower risk of heart disease, stroke, type 2 diabetes, depression, some cancers, and obesity. Adequate, safe, and community-scale space for outdoor recreation can influence physical activity behavior among residents. Studies have found that access to outdoor recreation can increase the rate of exercise for a surrounding population by 48 percent.
	Aesthetic	Green infrastructure can provide a number of benefits that will render an area more appealing to existing and future residents and businesses, in turn resulting in a positive effect for residents and the local economy. Trees, open space, and vegetation improve urban aesthetics and community livability.
	Community Cohesion	Numerous studies have shown that the more "webs of human relationships" a neighborhood has, the stronger, safer, and more successful it is. Several studies theorize that urban greening can foster interactions that build social capital. Social capital refers to the collective value of all "social networks".
	Crime Reduction / Enhanced Security	Increased social connectivity within communities has been demonstrated to improve safety and security, and green improvements can help provide environments to foster increased social interaction. Research suggests that increased vegetation, particularly in urban areas, may contribute to reduction in crime and foster safe environments.
ENVIRONMENTAL	Climate Regulation	Green Infrastructure helps lower ambient air temperatures, decrease the energy needed to warm and cool buildings, diverts stormwater from wastewater treatment in turn reducing energy used to treat stormwater, and increases carbon sequestration. All of this results in reduced carbon dioxide emissions.
	Water Quality	Stormwater runoff can be a significant challenge in urban areas. Water that falls on impervious surfaces picks up pollutants and enters the sewer system where it is then either treated or transferred into the environment. When a heavy rainfall event occurs, large volumes of stormwater can exceed the capacity of the system and result in overflows that release untreated wastewater into nearby lakes and streams. Green Infrastructure features collect stormwater runoff and allow it to infiltrate the ground or evaporate. Not only do they reduce the need for stormwater treatment, but they also contribute to fewer and lesser overflow events.
	Reduced Urban Heat Island	Urban areas experience warmer temperatures than surrounding rural areas. Green infrastructure creates shade, reduces the amount of heat absorbing materials, emits water vapor, and improves air quality and reduces atmospheric carbon dioxide, all of which cool hot air and reduce urban heat island (UHI) effect.
	Reduced Noise Pollution	Green infrastructure, particularly vegetative practices and permeable pavement, have the added benefit of reducing noise pollution. This reduction in sound generally makes these areas more appealing to potential business owners and future residents.
	Biodiversity	Ecological Biodiversity is the diversity of ecosystems, natural communities and habitats. In essence, it's the variety of ways that species interact with each other and their environment. By incorporating Green Infrastructure features, the community can promote a higher degree of biodiversity by providing a greater level of livable habitat.
	Air Quality	Air pollution is a significant and expensive urban problem, reducing the health of urban residents and damaging structures. Criteria air pollutants (nitrogen dioxide, sulfur dioxide, particulate matter, and ozone) impose a variety of health impacts, such as increased risk of bronchitis, asthma, and emphysema. Natural vegetation can absorb these air pollutants and reduce health risks in the surrounding population. The annual uptake and avoided pollutant emissions captured by natural vegetation is a direct benefit.
	Energy Use	Practices such as green roofs and tree planting reduce building energy use by lowering ambient air temperature, reducing the need for air conditioning. This benefit serves to capture this reduced building energy use.
	Residual Value	Throughout the life of a project, many design features need to be periodically replaced due to age. However, when a Green Infrastructure project's operating life comes to an end, many assets may still have an implicit residual value such as habitat for animals or food sources.
ECONOMIC	Poverty Reduction (Job Creation)	Implementation of Green Infrastructure measures would require unskilled or landscaping labor that may be filled by otherwise unemployed laborers. Benefits captured can include the avoided cost of social services that the government would provide if the same people were unemployed, as well as the availability of employment opportunities.
	Revitalization	Installation of Green Infrastructure measures and redevelopment of grey infrastructure can be a revitalizing aesthetic improvement to neighborhoods if the investment is large enough. This redevelopment can spur economic growth and benefits. The economic benefits of revitalization efforts may be measured through the anticipated added property value, economic output, and labor income created.
	Visitor Spending	Green Infrastructure, such as parks, can play a role in a city's tourism economy; some parks are a tourist attraction by themselves. Others may be venues for festivals, concerts, and sporting events. Capturing visitor spending due to new Green Infrastructure can provide additional benefits to a project area.

GREEN NETWORK. PUBLIC SPACES

CITY-WIDE SCALE



At the scaled approach it is also applied when defining the network of open public spaces. Firstly, it was key to identify the larger natural elements which will provide services to the city level. These are the bigger scale spaces in size and programme and are generally allocated along main arteries.

The uses related to these places are:

- » Riparian recreation areas
- » Forests
- » View points
- » City Park
- » Botanical gardens
- » Stadium
- » City Market
- » Urban Agriculture
- » Waiting rooms for public transport

NEIGHBORHOOD SCALE



The next scale is the one at neighborhood level. Therefore, they are the second spaces in size and programme. Because of this scale they are usually allocated related to secondary roads.

The uses related to these places are:

- » Sport field
- » Multi-purpose spaces
- » Markets
- » Squares
- » Urban Agriculture
- » Water Parks
- » Schoolyards
- » Waiting rooms for public transport

COMMUNITY SCALE

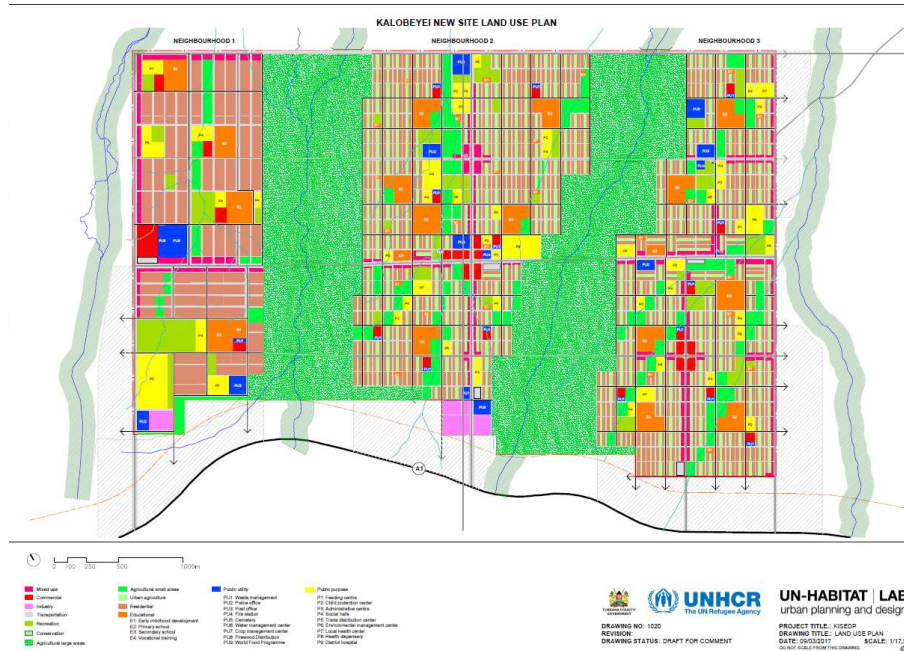


Finally, the smallest scale of open public spaces would be the community level. These spaces are the smallest in size and programme and are generally allocated along the tertiary roads.

The uses related to these places are:

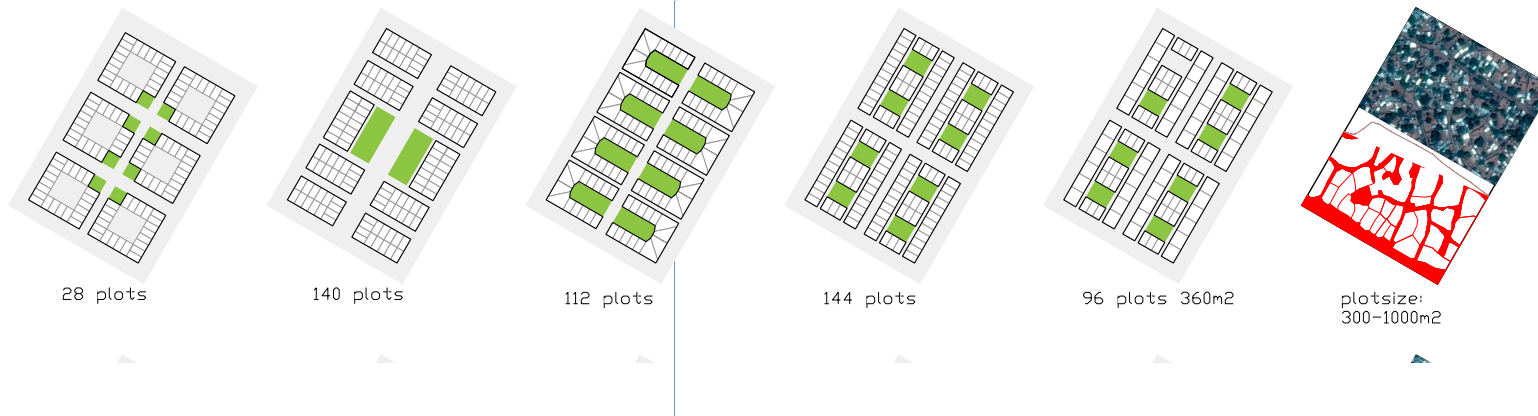
- » Pocket Parks
- » Small squares
- » Passages
- » Urban Playgrounds
- » Street micro-interventions
- » Seating spots
- » Reading areas

Kalobeyei Refugee Settlement

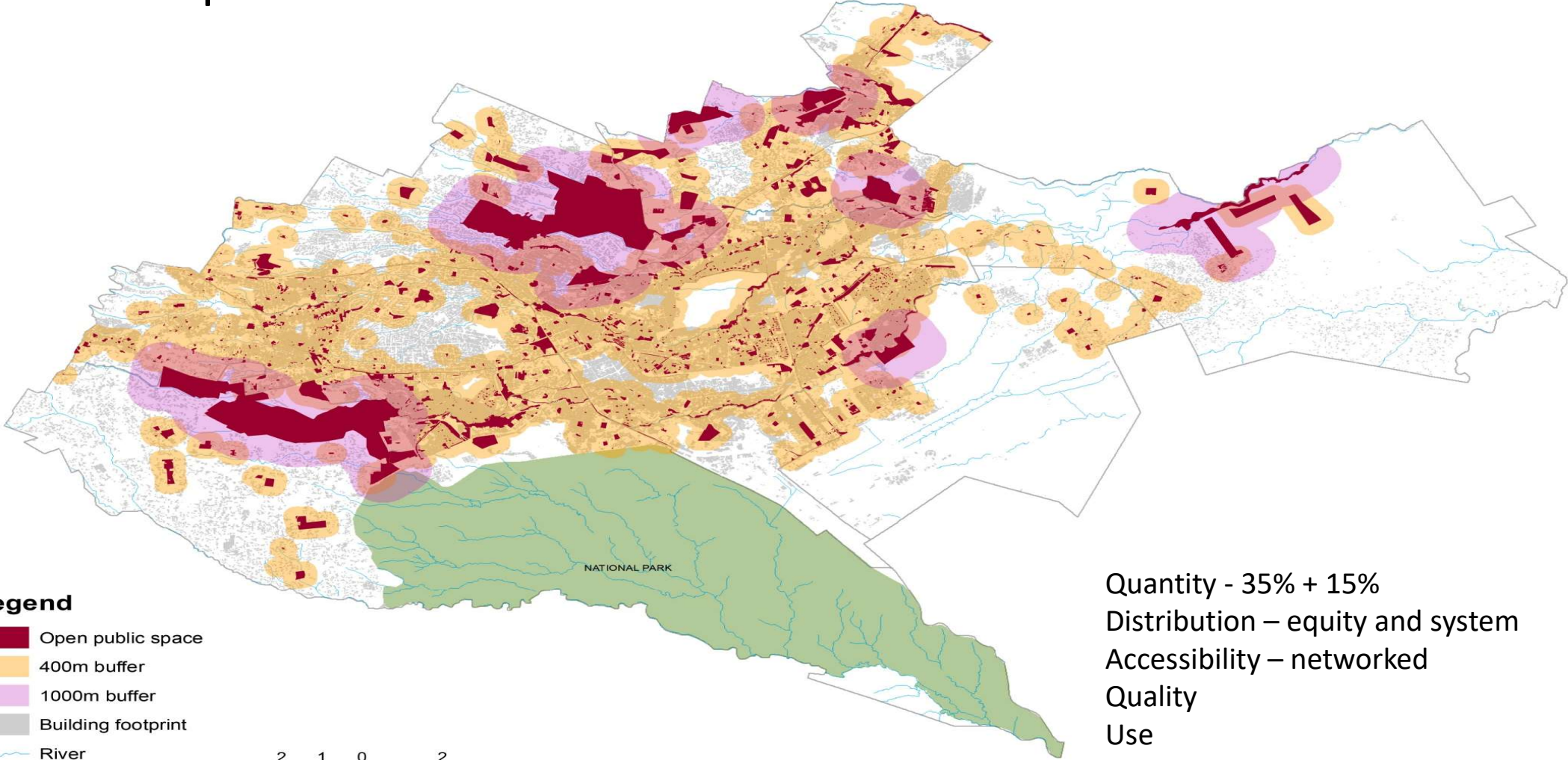


From Camp to Settlement

- Improve settlement pattern
- Develop public space
- Increase mixed use
- Integrate natural systems (blue and green) – neighborhood and plot
- Economic opportunities near access roads
- Better locate services (schools)
- Integrate host community
- Training for livelihoods and management



Public Space Assessment



- Legend**
- Open public space
 - 400m buffer
 - 1000m buffer
 - Building footprint
 - River
 - County boundary

2 1 0 2
Kilometers

Quantity - 35% + 15%
Distribution – equity and system
Accessibility – networked
Quality
Use



**SUSTAINABLE
CITIES AND
COMMUNITIES**

SPECIFIC TARGETS AND INDICATORS:

SDG 11.3 – Planning capacity

Indicator: Land consumption rate to population growth rate

SDG 11.7 – Access to public and green space for all

Indicator: Amount of public space available and accessible

Towards green development

A long term agenda that can be put in motion today by leveraging and promoting locally appropriate solutions and building on targeted adaptation, mitigation and inclusion.

Technical choices:

- decentralization of energy, waste treatment, conservation and renewable energy:
 - green infrastructures and backbone to support environmental services provided by ecosystems, water and energy systems;
 - alternative forms of mobility and supportive infrastructure;
 - promotion of higher densities through land use planning, infrastructure planning, strategic location of corridors for mobility and service delivery.

Targeted adaptation

- Identify **risk and vulnerabilities scenarios** – mapping, data use
- Identify **priorities and target groups** – consultation, participation
- Develop **risk reduction plans** including investments, awareness/training, community mobilization, monitoring and alert systems
- Typical **areas of intervention** (incentives and investment):
 - Water management, water supply, conservation, harvesting...
 - Infrastructure and housing hardening, drainage improvement and maintenance.....
 - Land management, relocation of slums, positive land uses (urban agriculture, etc), ecosystem reclaiming (mangrove, wetlands)
 - Reclaiming of areas under threat (*Lagos Eco Atlantic Village*)
- Develop **tools and policy recommendations/** regulations etc. - in view of institutionalizing recurrent interventions etc.