



**URBAN DEVELOPMENT INITIATIVE (UrDI)**  
**FOR THE CANAAN AREA OF PORT-AU-PRINCE**  
STRATEGIC URBAN DEVELOPMENT FRAMEWORK  
2016



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## Disclaimer

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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**COMPACT**

**ACCESSIBLE**

**SOCIALLY INCLUSIVE**

**RESILIENT**

**ECONOMICALLY VIBRANT**

**QUALITY OF LIFE**

**COORDINATED**

## **VISION FOR THE STRATEGIC URBAN DEVELOPMENT FRAMEWORK**

In the series of charrettes and meetings that have been held in accordance with the Urban Development Initiative (UrDI), the vision for the northern area of Port-au-Prince has been widely debated and discussed. This process has brought together the different future perspectives and aspirations for the area from both decision makers and the affected populations. Different perspectives from the National Government, municipalities, professionals engaged in urban planning, private sector actors, academics, community groups and residents were gathered and post discussion a joint vision was deduced.

As a result of urban interventions, presentations, workshops and comments by the different stakeholders, the plan encompasses a wide variety of visions reflecting local challenges and the diverse population already inhabiting the area.

In the visions of the different actors the northern area of Port-Au-Prince is presented as a system of interrelated urban, peri-urban and rural environments with the following characteristics:



## COMPACT

The northern area of Port-au-Prince should be developed taking into consideration the principles of density and proximity. Given the limited space for development, urbanized zones in the northern area of Port-au-Prince should increase the number of residents per km<sup>2</sup> as well as the proximity of dwellings and facilities, to promote a more financially feasible service delivery and benefits from economies of agglomeration.

## ACCESSIBLE

In order to develop the northern area of Port-Au-Prince in a sustainable manner, the connectivity of the area should be prioritized to enable the adequate circulation of people and goods, and to ensure access to jobs, housing and services.

## SOCIALLY INCLUSIVE

Development of the northern area of Port-Au-Prince must provide space for the different social and economic groups to live together and benefit from the economic and social opportunities provided in the area.

## RESILIENT

The development of the northern area of Port-Au-Prince should include adaptation and mitigation strategies to enhance the resilience of the area against hazards associated with natural disasters.

## ECONOMICALLY VIBRANT

Territorial and urban planned development will cater to the local population by ensuring the creation of solid the social and physical infrastructure that encourages economic opportunities for residents and investors in the area. Existing economic activities need to be supported and promoted to create a northern area that can unlock the economic potential of agriculture, industry, logistics, trade and the commerce, construction, tourism and service industries.

## QUALITY OF LIFE

Urban development should not only provide services, facilities, housing and job opportunities but also generate an area with an urban quality that attracts residents and businesses due to the high proliferation of public spaces, green areas, recreational areas, markets and transport hubs.

## INSTITUTIONAL COORDINATION

The joint work and coordination of national government, municipalities and community organizations must be in place to provide long term and sustainable urban development solutions, with clearly demarcated roles and responsibilities for the various stakeholders.

During the first and second charrette, these seven structuring axes for the vision were addressed and developed separately in the context of working groups, resulting in an extended elaboration of the priorities that each of them entail which are subsequently described on the following pages.



## 1. COMPACT

A compact northern area of Port-au-Prince provides several advantages namely the potentiality to locate houses and jobs closer to each other. Residents do not need to commute long distances to work or to access health or education services, as they are able to find secondary services in the vicinity of their homes. This vision of compactness entails and requires a clear hierarchy of main, secondary and tertiary activity centers that provide services to residents according to scale, location and role in the network of settlements.

The northern area of Port-au-Prince is composed of a system of urban centers, centralities and neighborhoods, peri-urban and rural areas. These main and secondary settlements are connected through infrastructure and services, and depending on their internal hierarchy, provide more or less specialized services to residents.

At the metropolitan scale, the main center is the city of Port-au-Prince, where residents find job opportunities and services in high concentration such as government administration, national business headquarters and international logistics firms. The secondary centers are Croix de Bouquets and Cabaret, which nowadays provide most of the administrative services for the residents of this area together with the metropolitan area. Tertiary centers provide health services, leisure services, commerce, jobs and housing to the population. Although not so clearly defined, developing these centers for further service provisions to residents is crucial in order to create a more compact urban development that eliminates the need to travel long distances to access services. The tertiary centers of the area are Bon Repos, Onaville, Corail, Canaan, Bellevue, Philadelphie, Jerusalem, St. Christophe, Titanyen, Lafito, Aubry, and Dechapelle.

As elaborated in the analysis and diagnostic document, the northern area of Port-au-Prince presents the following problematics regarding compactness:

- » Complex topography and hydrology reducing available and adequate land for urban development
- » Insufficient coverage of basic services and public space in consolidated areas and lack of land reserve for provision of basic services and public space in new developing areas
- » Generalized sprawl and consumption of agricultural land
- » Land tenure and property issues reduce the availability of land and transparency of the market



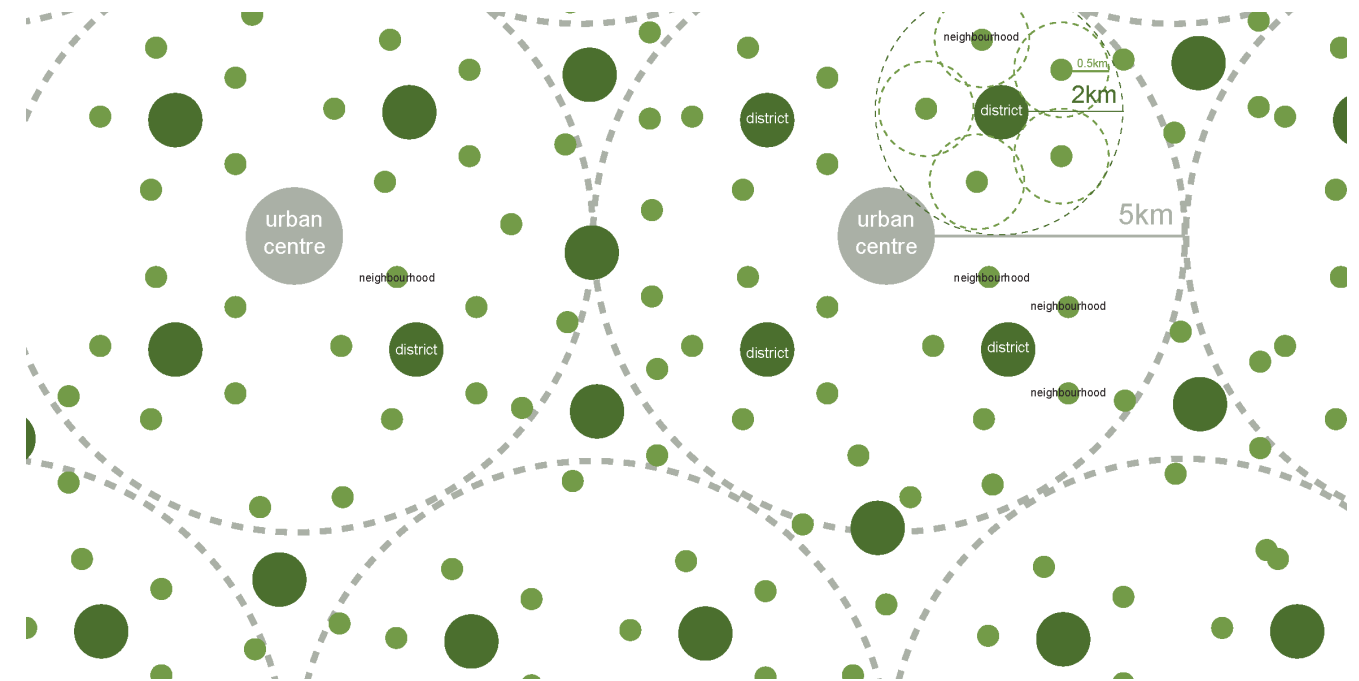


Fig.1: Proposed urban network scheme

In order to address these challenges, the current Strategic Urban Development Framework proposes a series of implementation strategies developed in the last part of the document. In this sense, enhancing proximity and connectivity of urban centers and centralities is critical to ensuring the creation of a network of residential, commercial and job centers, that can result in the agglomeration and specialization of activities.

The proposed urban network scheme is based on distributing needs and services supply, in order to decentralize the bigger urban centers and derive some of their activities and facilities to smaller central areas. The strategy consists of a small scale network of centers with an impact radius of around 0.5km that includes basic services, another network of medium centers with larger scale facilities and an impact radius of around 2km, and metropolitan-scale centers with an impact radius of 5km with services such as governmental institutions. By managing these three scales, multiple connected networks are created that meet the needs of different populations depending on the scale of services they require. This allows each and every citizen to have basic services in close proximity to where they go about their everyday lives, facilitating mobility and quality of life for citizens.

The proposed new centers are to be located in areas already with a high proliferation of activities. Specifically, many of these areas are located where roads converge, in and around street markets, schools, administrative buildings, hospitals etc. As described before, enabling connectivity of different scales allows populations to meet their needs while lessening their environmental impact.

The existing provisions of adequate roads, streets and public space, water and electrical infrastructure as well as affordable housing, should form the parameters for determining the location of activity centers. These are areas that should be nurtured and intensified. In most cases, these centers appear at the intersection of existing main roads or along major streets, and it is the existence of these already developed areas that should define the locations of areas that are to be augmented.

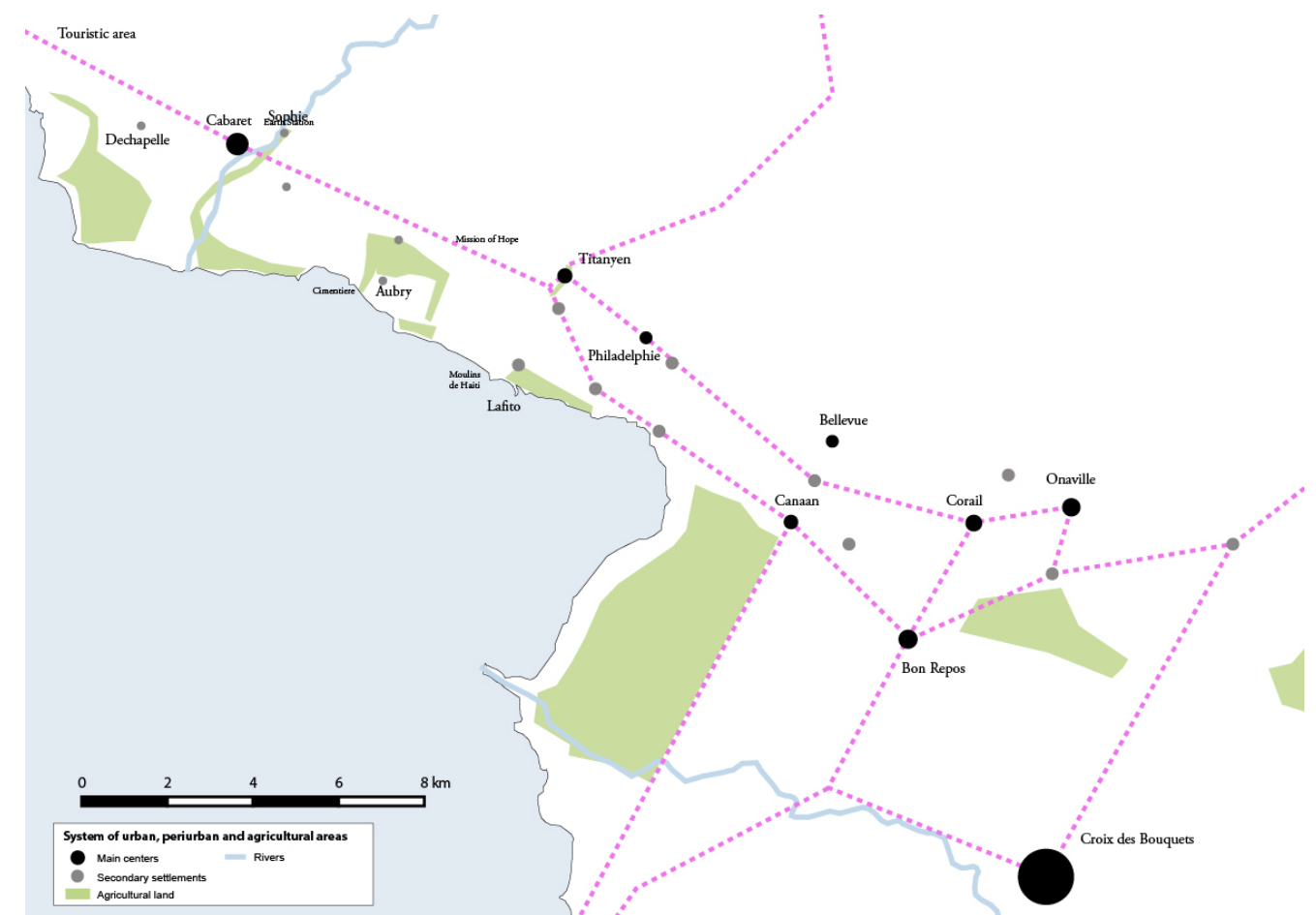


Fig.2: Proposed system of urban, peri-urban and agricultural areas



## 2. ACCESSIBLE

An accessible northern area of Port-au-Prince allows residents commuting for work or traveling to access services to enter the area via different means of affordable transportation and avoid traffic congestion. The provision of adequate road infrastructure encourages multi-modal travel and the use of multiple alternative routes within the urban pattern. It also connects main, secondary and tertiary urban centers with rural and production areas. By providing public transport articulated through transport hubs located in compact mixed use areas next to quality public spaces, the population can easily find sufficient accommodation in the area. If this is not possible, accessible cities also mean that one's daily commute should not take more than 30 minutes or 10% of one's salary.

The metropolitan area of Port-au-Prince, as presented in the analysis and diagnostic document, is currently growing in four main directions. From these, the one with the best location and largest development potential is the northwestern direction. In order to avoid the unsustainable and insufficiently planned growth that took place in the southern part of the metropolitan area towards Carrefour, the northern area of Port-au-Prince needs to address the adequate provision of road and street infrastructure.

The northern area of Port-au-Prince presents the following challenges regarding connectivity:

- » Complex topography and hydrology hamper ease of movement
- » Lack of adequate land allocated to roads and streets in consolidated areas
- » Different areas of the city are poorly connected due to the disconnect between roads and streets, with connectivity relying in most cases on individual arterial roads through which all the traffic is forced to flow and therefore resulting in congested traffic
- » Low density developments render mass public transport models unaffordable, resulting in an increased reliance on cars and low occupancy of public transport vehicles
- » Little to no enforcement of road traffic regulations

In order to address these challenges the development model of the city should shift from a disconnected urban pattern to a grid urban structure, that ensures the connectivity of different urban centers and neighborhoods. Connectivity between urban centers of activity (Fig.3) is ensured by a combination of both by main roads and a street network, providing alternative routes for residents to reach the different destinations.

In accordance with UN-Habitat's principle of allocating around 30% of urban land to streets, the continuity of the street network inside the conurbations also facilitates the creation of newly connected urban patterns that enhance mobility and accessibility. In order to improve accessibility both to and within the area, a clear definition of national and arterial roads as well as main, secondary and neighborhood streets needs to be put into place to prioritize infrastructure investment according to the needs at the different levels of the road and street network hierarchy.



The vision to promote accessibility in the area proposes the enhancement of existing infrastructure and development of new arterial roads and boulevards that will provide alternative routes to connect different urban, peri-urban and rural areas. Furthermore, connectivity amongst settlements should rely not only on private road transportation but also on affordable and sustainable public transport. A mobility strategy needs to be put in place to ensure the effectuation of sustainable mobility patterns that do not only rely on cars. This can be first accomplished by assessing the future infrastructure requirements of the northern area of Port-au-Prince.

On the one hand, the mobility strategy for the northern area of Port-au-Prince requires addressing connectivity between secondary centers and the capital to ensure fluidity in daily commutes. On the other hand, connectivity of secondary centers amongst themselves needs to be also reflected in the strategy, to facilitate economic development and interaction between these areas, with the goal of decongesting the centers and reducing the number of trips. Inside the main secondary centers, Croix-des-Bouquets, the Northern area of Canaan, Cabaret and Thomazeau, the mobility strategy also needs to be addressed to foster local economic development and ensure access for the residents to services developed inside the secondary centers.

Rules and regulations as well as their enforcement is also critical to ensuring that the enhanced and newly built infrastructure operate efficiently and are not hindered by externalities resulting from encroachment of other activities onto public land allocated to roads and streets. In this sense, the role of the national and the municipal governments is key not only for the implementation of these infrastructure projects but also for their maintenance and protection.

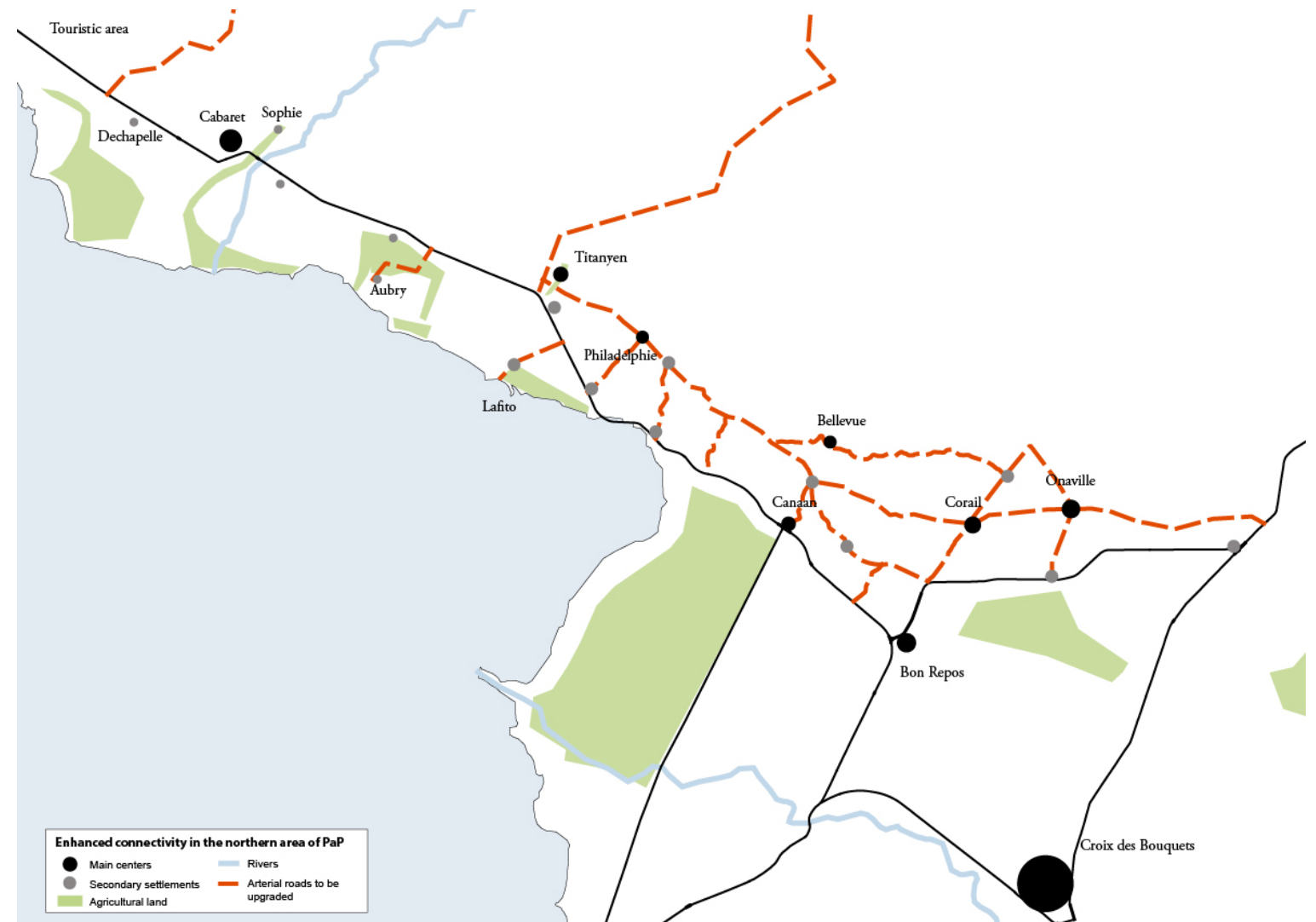


Fig.3: Enhanced connectivity for the northern area of PaP



### 3. SOCIALLY INCLUSIVE

A socially inclusive northern area of Port-au-Prince would be able to provide quality jobs and affordable services and homes to residents. Different housing options articulated around quality public spaces should be made available in order to bring together different income groups. This vision would be achieved by investing in infrastructure and provision of basic services such as health and education.

### BACKGROUND

The budgetary constraints of national and local governments in Haiti are posing a challenge to maintaining the level of progress that government has made in improving human indicators such as poverty reduction, primary school enrollment and access to water. Populations living on less than \$1.25 a day in extreme poverty had dropped from 31% in 2000 to 24% in 2012 (World Bank, 2015<sup>1</sup>).

Haiti is among the countries with the highest Gini Index in the world, ranking 6th in 2012 with a 0.62 coefficient. Although extreme poverty has declined especially in urban areas, strong regional disparities remain. Poverty reduction, one of the main pillars of social inclusion, has occurred as a result of private wealth transfers and labor income, with a particular high contribution from sectors such as commerce, restaurants and hotels (33%), construction (30%), transport and communication (20%) and manufacturing (10%). Policies to ensure more inclusiveness could be introduced if Haiti were to invest in health, education and infrastructure, as well as greater political stability.

Poverty reduction has become an even more important part of Haitian Government agenda since 2004. In that year, the government developed the interim framework for poverty reduction, which became the National Strategy Document for Growth and Poverty reduction (DSNCRP) in 2007, and the Action Plan for National Recovery and Development of Haiti (PARDH) in 2010 after the earthquake. The Strategic Plan of Development of Haiti (PSDH) was developed in 2012, resulting in the first Triennial Investment Programme (PTI) 2014-2016, which very strongly linked economic development to poverty reduction.

In 2014 the interinstitutional technical committee led by the National Observatory of Poverty and Social Exclusion (ONPES) developed and certified the first official national poverty line for Haiti. This poverty line, inspired by the cost-of-basic-needs approach sets the value of the moderate poverty line at G 81.7 (\$ 2.41 PPP of 2015) and the extreme poverty line at G 41.6 (\$ 1.23 PPP of 2005). Both are based on the Enquête des Conditions de Vie des Ménages Après le Séisme (post-earthquake household living conditions survey, ECVMAS 2012).

According to these baselines, the incidence of poverty and number of poor in urban and rural areas is comprised of the following percentages:

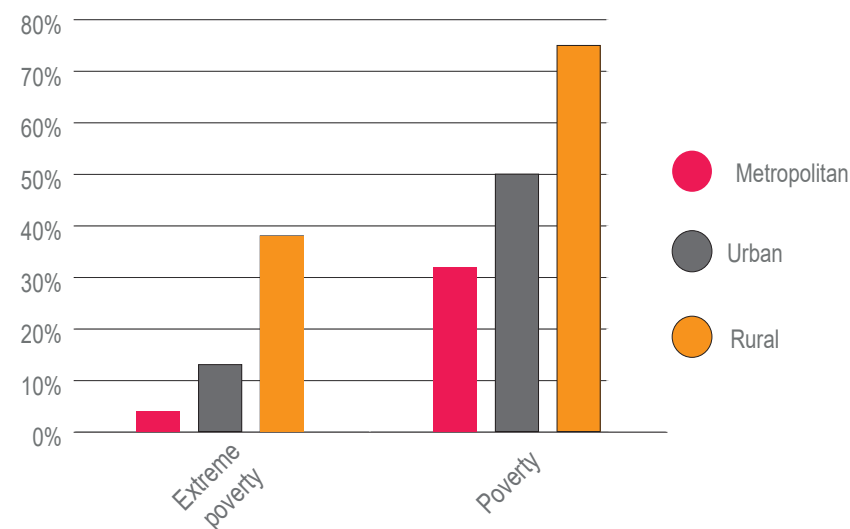


Fig.4: Incidence of poverty and number of poor in metropolitan, urban and rural areas. Data World Bank.

Only 2% of the population consumes over \$10 per day, which represents the threshold to join the middle class in the region. Access to basic services is a central indicator of social inclusion. Comparing the coverage rates of basic services from 2001 and 2012 for urban and rural areas, it is evident that urbanization processes increase access to these services for urban residents. For example access to education is 6 percent higher in urban areas than rural areas. Also access to improved drinking water sources, energy, sanitation and quality building materials is also higher in urban areas by 4%, 52%, 32% and 40% respectively.

Linking to the work developed in the analysis and diagnostic, the main challenges in terms of social inclusion that the northern area of Port-au-Prince is experiencing is the need to respond to two different realities; the identity challenges in the urban and rural context.

INDICATOR	URBAN		RURAL	
	2001	2012	2001	2012
School-age children in school	84	93	74	87
Access to improved drinking water sources		55		52
Access to energy	62	63	11	11
Access to improved sanitation		48		16
Quality Building materials	71	81	33	41

Table 1. Access to basic services. Adapted from Singh, Raju Jan and Mary Barton-Dock. 2015. Haiti: Toward a New Narrative. Systematic Country Diagnostic. Washington, DC: World Bank

**Rural context:**

- » Income generation is often stagnant in rural households in which the main economic activity is agriculture and represent 80% of the population in extreme poverty
- » Increased reliance on a low-performing agricultural sector and production for home consumption
- » Lack of market transparency reduces farmers’ chances to sell products at an adequate price
- » Lack of adequate infrastructure ensuring consistent and high quality economic flows of products from rural to urban areas



### Urban context:

- » Labor force participation rate is low compared to regional average (ie. metropolitan area rate (66.4%) is slightly higher than rural area rate (63.3%))
- » Gender, age and education are factors closely linked with informal employment or underemployment
- » Internal and international migration and remittance supports many urban households' income. New self-sufficient income sources needed to encourage reliance on local products and support better the urban/rural interaction
- » Segregation of income groups vis-a-vis the urban structure does not facilitate the redistribution of income between different social groups
- » Provision of basic services such as health and education inadequate in the northern area of Port-au-Prince
- » Large number of natural disasters combined with lack of social protection policies causes many families to fall back into poverty

The urbanization process that is taking place in the northern area of Port-au-Prince represents a huge opportunity to foster social inclusion. The northern area of Port-au-Prince, due to its prime location, has the potential to generate jobs, services and homes for residents. Taking advantage of the development of international trade and commerce, construction, transport and manufacturing, the area would be able to provide employment for the growing population.

The three main pillars discussed to promote social inclusion are:

- » Boost of income generation through diversification of economic activities and policies to enhance local businesses and promote quality self employment. In rural areas, productivity can be enhanced by improving access to natural fertilizers and pesticides, seeds, machinery, distribution chains and encouraging the diversification of crops. Access to alternate jobs in non-farm related sectors can improve the quality of the rural labor force. In urban areas, the focus should be on capacity development of workers through education and training.
- » Improving provisions of basic services such as education and health, as well as investing in basic infrastructure such as electricity, water and the road network. In this sense, special focus needs to be paid to sustaining and increasing access to primary education. Both the infrastructural side of education as well as the quality of the service delivered need to be addressed to reduce the rate of school abandonment. Regarding healthcare, there is a need to expand the coverage, access and quality of healthcare infrastructure. This can more easily and cheaply be done in an urbanized context where populations are in closer physical and social proximity.
- » Implementation of public participation mechanisms/protocols that specifically foster and encourage the participation of marginalized demographics in the decision-making process in order to improve their communities.





## 4. RESILIENT

A resilient northern area of Port-au-Prince is ready to respond to natural, social and economic threats. More widespread access to education and health services results in a population more prepared to respond to the risk and uncertainty that arises as a result of climate change. Streets are safer and construction quality enhanced to withstand natural threats. Native biodiversity is restored and preserved by reforestation and limitation of urban expansion through the preservation of environmental areas and defining of non-aedificandi areas in flood and erosion-prone areas.

## BACKGROUND

Resilience refers to the ability of human settlements and inhabitants to withstand and to recover quickly from any crisis, natural or otherwise. Resilience against crisis not only refers to reducing risks and damage from disasters but also to the ability to quickly bounce back to a stable state. While typical risk reduction measures tend to focus on a specific hazard often disregarding the interconnectivity of risks and vulnerabilities, the resilience approach for the northern Port-au-Prince adopts a multiple hazards approach, considering resilience against all types of plausible hazards and both the technological and social fixes.

Haiti is one of the world's most disaster-prone countries, exposed regularly to a variety of events including earthquakes, floods and hurricanes. It is the Caribbean country with the highest number of disasters per km<sup>2</sup>. The earthquake in 2010 killed 220,000 people, displaced 1.5 million people and destroyed the equivalent of 120% of Haiti's GDP. The average yearly impact of natural related hazards in Haiti during the last 45 years has been 2% of the GDP. When compared with the Dominican Republic, even though both countries share the same island, the number of weather-related disasters such as floods and droughts double and triple respectively. This is due to the lack of adequate flood-mitigating infrastructure as well as the severe deforestation throughout the country.

Frequency and impact of natural disasters (1971- 2014)

Country	Number of natural disasters	Disasters / year	Death / population (millions)	Total damage / GDP
Haiti	137	3.1	23,427	1.78
Haiti excluding earthquake 2010	136	3.1	1,855	0.22
Dominican Republic	60	1.4	311	0.05
Jamaica	34	0.8	102	n.a.
Nicaragua	66	1.5	2,363	0.33
Honduras	70	1.6	3,298	0.4
El Salvador	51	1.2	687	0.34
Guatemala	82	1.9	1,754	0.12

Table 2. Regional frequency and impact of natural disasters, Data: World Bank. Adapted from Singh, Raju Jan and Mary Barton-Dock. 2015. Haiti: Toward a New Narrative. Systematic Country Diagnostic. Washington, DC: World Bank

Resilience does not only relate to acute shocks linked to natural hazards. Disease outbreaks linked to or triggered by these impacts also affect the resilience of human settlements. Chronic stresses such as high unemployment, lack of adequate access to health or education, food and water shortages, traffic congestion or endemic violence also undermine a settlement’s resilience. To provide an estimation, 78% of households in Port-au-Prince, 89 percent of households in other urban areas, and 94 percent of rural households experienced at least one shock per year.

**“TEN ESSENTIALS RESILIENCE METHODOLOGY”**

UN-Habitat, together with international organizations and local governments increasingly apply a methodology to build resilience known as the “Ten Essentials”, which are:

- » Essential 1: Put in place organization and coordination to understand and reduce disaster risk, based on the participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness.
- » Essential 2: Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses, and public sector to invest in reducing the risks they face.
- » Essential 3: Maintain up-to-date data on hazards and vulnerabilities, prepare risk assessments, and use these as the basis for urban development plans and decisions. Ensure that this information and the plans for your city’s resilience are readily available to the public and fully discussed with them.
- » Essential 4: Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change.
- » Essential 5: Assess the safety of all schools and health facilities and upgrade these as necessary.
- » Essential 6: Apply and enforce realistic risk compliant building regulations and land use planning principles. Identify safe land for low-income citizens and upgrade informal settlements, wherever feasible.
- » Essential 7: Ensure education programs and training on disaster risk reduction are in place in schools and local communities.
- » Essential 8: Protect ecosystems and natural buffers to mitigate floods, storm surges, and other hazards to which your city may be vulnerable. Adapt to climate change by building on good risk reduction practices.
- » Essential 9: Install early warning systems and emergency management capacities in your city, and hold regular public preparedness drills.
- » Essential 10: After any disaster, ensure that the needs of the survivors are placed at the center of reconstruction, while supporting them and their community organizations to design and help implement responses, including rebuilding homes and livelihoods

The northern area of Port-au-Prince is a topographically complex area, with steep mountains and ridges that limit the amount of land suitable for urban development. The watershed system is intricate with main ravines flowing laterally across main settlements. Flood and erosion risks are high and have a strong impact on the durability of the infrastructure as well as the provision of services and quality of life of residents.

Deforestation also represents a great challenge for the resilience of the area. The presence of trees is fundamental to the soil's water retention and without this quality a cyclical chain of disasters often ensues causing droughts, erosion and leading to extreme temperatures and the overall degradation of the quality of the urban environment. Strategies to recover endemic vegetation that limit the expansion of settlements further to the north must be put in place.

Construction quality of civil infrastructure and buildings must be seen as a priority, while careful attention must be paid to the use of new materials in order not to make the same mistakes made in other rapidly developing regions. Given the number of natural disasters that affect Haiti every year, preparedness and structural integrity are a crucial part of reducing the impacts of these events. Yet residents must be included in these processes and empowered to collectively respond to disasters in a way that does not affect their ability to provide for their families, while encouraging opportunities of social resilience to environmental challenges.

In order to prioritize the challenges reflected in the analysis and diagnostic document, the northern area of Port-au-Prince presents the following resilience related issues:

- » Lack of coordination of national and international actors to respond to hazards
- » Lack of risk management and social protection policies increases the exposure of the population to natural hazards
- » Large percentage of the population located in flood-prone and landslide risk areas
- » Urban sprawl is having a strong impact in biodiversity and amount of agricultural land. Deforestation of the country and in particular of the northern area of Port-au-Prince is increasing the frequency and effects of hazards
- » Insufficient infrastructure provision and lack of maintenance severely hampers the ability of government and emergency organizations to promptly respond to hazards

In order to tackle these challenges, a series of strategies are proposed:

- » Promote adequate risk management at all scales by ensuring support and coordination through the Directorate of Civil Protection (DCP) and the National Disaster Risk Management System (NDRMS)
- » Assess the social protection requirements and develop social protection policies for the poor and vulnerable
- » Include local stakeholders in the knowledge sharing of disaster-resilience program implementation; ie. Ensure that all members of the population participate in the planning and technological fixes to make their own communities more resilient so that the importance of this is conveyed
- » Make use of strategic and urban planning as the main tools to ensure the identification of non-aedificandi areas at the city and neighborhood levels and the development of urban areas on land fit for urbanization land
- » Develop policies, regulations and participatory processes to facilitate the identification, compensation and relocation of households in risk-prone areas
- » Develop a reforestation and tree-planting strategy
- » Develop a participatory process of all stakeholders to identify, prioritize and contribute to the financing of required infrastructure



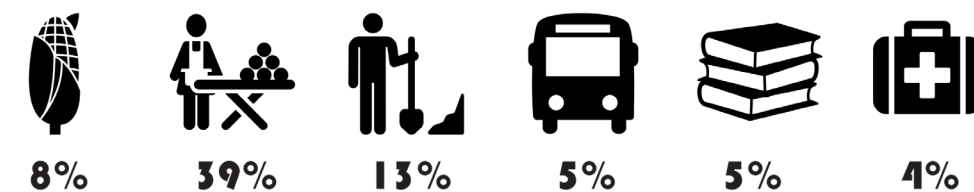


## 5. ECONOMICALLY VIBRANT

In 20 years time, the northern area of Port-au-Prince will have become the main economic motor of the metropolitan area of Port-au-Prince. Strategic investment and development of priority sectors will supply the area with a diversified economy that relies on agribusiness, trade, commerce, health and education services, construction and industrial production of goods. The improvement of public services and environmental improvement of the area will also contribute to generating economic activities for the residents. This economic development should go hand in hand with the creation of socially inclusive and gender policies and a transparent and participative governance structure.

Haiti's economic growth has averaged 1.2 percent per year from 1970 to 2013, which is far beyond the average of the Latin America and Caribbean region, close to 3.3 percent per year. This growth has been largely driven by an expanding labor force as a result of the increase in numbers of the working age population. Natural hazards have had a strong impact on the economic development of the country, both hindering growth but also bringing aid flows especially following the 2010 earthquake. Political instability has hampered investment and growth as it is estimated that Haiti would have grown 1.2 percentage points faster in conditions of more political stability.

### DISTRIBUTION OF JOBS IN THE NORTHERN AREA OF PORT-AU-PRINCE



The agricultural sector constitutes 40% of the total number of jobs in Haiti but it only represents 8% of the metropolitan area of Port-au-Prince (World Bank, 2014). Agricultural production is often linked to low-productivity subsistence farming. Factors that prevent agriculture from becoming a healthy commercial business are adequate rural infrastructure, land tenure insecurity, lack of research and technology and difficulty in accessing both startup capital and skilled human resources.

Trade employs almost 40% of the population in the northern area of Port-au-Prince. The majority of trade workers are self-employed and it is this sector that contains the highest percentage of women, those living in poverty, while also being the least well paid.

Both the agriculture and trade sectors provide earnings that are lower and more variable than other sectors, meaning that deviation from average income is higher than in the transport, construction, education and health sectors.



Light manufacturing represents a competitive opportunity for the development of the northern area of Port-au-Prince, of which exports mainly to the United States, have been growing at around 18 percent per year, employing 30,000 workers in 2016. Nevertheless, as long as international competitiveness remains low due to high electricity and port costs, the regional competitive advantage will rely on cheap labor and low wages.

Mining could also represent an economic development motor, with estimations of substantial deposits of gold, silver, copper and aluminum bauxite for a total market value in 2013 of about USD 5-6 billion for the country. An appropriate policy, regulatory and institutional framework would need to be put into place to attract and secure investments while minimizing the environmental and social impacts of the exploitations.

Tourism is one of the sectors that has the potential to contribute significantly to the economic growth of the northern area of Port-au-Prince. The area's tourist sites some of them classified as UNESCO World Heritage sites, include beach, nature and cultural activities. According to the World Tourism Organization, in 2013 there were around one million tourists visiting Haiti every year.

Unreliable access to electricity and the limited number of qualified human resources and credit generate an unfavorable business climate that encourages a large portion of the population to emigrate. In 2010, one million Haitians decided to leave the country to seek a better future abroad. (World Bank, 2015).

According to the Global Competitiveness Index (GCI), and linking with the analysis and diagnostic document, the major constraints to achieve economic competitiveness in the northern area of Port-au-Prince are:

- » Limited agricultural productivity linked to lack of crop diversification, access to basic inputs and accessibility of output markets
- » Lack of adequate infrastructure to foster economic activity, productivity and reduction of externalities
- » Limited access to finance and excessive reliance on transfers and remittance
- » Time consuming administrative procedures to open a business and pay taxes, result in a challenging start-up business environment

- » Land tenure insecurity adds another hindrance to business development and private investment

The northern area of Port-au-Prince presents great development opportunities thanks to its prime location in close proximity to the coast. Tourism, port activities, logistics and productive activities such as industry and agriculture, benefit from this and as well as the location adjacent to main infrastructure routes such as Route Nationale 1 and 3. A new logistics hub located next to the recently opened Lafito Port facilitates the movement of light industrial products and agri-products. Further to the north, towards Arcahaie and Grois Morne, a Tourism Economic Zone is created to leverage the potential of economies of agglomeration of tourism service providers.

In order to tackle the previously mentioned challenges, a series of development strategies are proposed and developed in this Strategic Urban Development Framework to promote economic development of the northern area of Port-au-Prince such as:

- » Land regularization
- » Orderly and effective spatial planning
- » Adequate provision of infrastructure and services
- » Entry of responsive governance
- » Improvement of transport linkages - roads, streets, transit routes and stations
- » Improvement of workforce development and entrepreneurship potential through better schools, vocational centers and expanded access to ICT
- » Leveraging of the northern area of Port-au-Prince for larger scale industrial and logistic investment, potentially in agri-processing, manufacturing, energy production and transport hubs
- » Creation of Touristic Economic zones in the northern area of Port-au-Prince (towards the west) to promote investment and benefit from economies of agglomeration

Prosperous cities provide amenities and social services such as education, health, recreational facilities, safety and security required for improving living standards, enabling the population to maximize the potential of individuals to lead fulfilling lives.



## 6. QUALITY OF LIFE

A northern area of Port-au-Prince that offers quality of life to residents has built a strong cultural identity to form a vibrant and new Port-au-Prince through a system of symbolic public spaces and by developing quality urban design. Streets are safe spaces where the population can meet and where multiple public activities take place, creating more cohesive and engaged communities that actively take part in the development of the area.

Quality of life underpins the functionality of cities: the notion is at the crossroads of all policies and actions, and represents a synthesis of all the dimensions of prosperity. Inhabitants value the freedom to live and work freely, good quality of education, adequate housing with basic services, public spaces and meaningful employment with decent income as the most important factors promoting quality of life and prosperity in their cities. Still it must be emphasized that quality of urban life is a broader concept that includes a full range of factors.

UN-Habitat's *City Prosperity Initiative* measures quality of life through four main sub-dimensions:

- » Health
- » Education
- » Safety and Security
- » Public space

Within these four dimensions, a range of twelve indicators measure quantitative data to provide an accurate measurement at a certain point in time that serves as a reference point to analyze the evolution of quality of life indicators.

In order to assess the progress in provision of service and public space after the implementation of the initiative, the different layers of the services be mapped and quantified during the process.



Priority areas of intervention to foster quality of life in the northern area of Port-au-Prince would be:

- » Promote access to health through social protection and investment in infrastructure and governance of healthcare centers
- » Promote the development of a secondary network of neighborhood clinics to bring healthcare closer to residents
- » Increase number of public schools and increase public financing of education to support families in their costs in order to reduce the barrier to access
- » Improve safety and security through the strengthening of government institutions, coordinated work with community groups and NGO's and promotion of urban planning and design as a tool to create safer urban environments
- » Enhance identity and culture through symbolic spaces and heritage preservation
- » Enhance the role of the street as a multi-functional urban space and integrate natural spaces and recreational areas
- » Greening of urban and peri-urban areas through reforestation with endemic species; Support place-making through urban design
- » Ensure the design and construction of high quality public spaces that encourage interaction between communities
- » Promote a system of green spaces



*Fig.5: Installation of standalone photovoltaic panels as an alternative approach to increase access to electricity*





## 7. INSTITUTIONAL COORDINATION

An institutionally coordinated northern area of Port-au-Prince would bring together different national and municipal stakeholders in a negotiated agreement to generate economic growth, capture added value of economic activities and bring these back to civil society as enhanced provisions of urban services. This coordination of stakeholders requires negotiation through effective participation techniques as well as firm political agreement. The different municipalities of the northern area must be brought together in developing a common understanding and clearly demarcating roles, responsibilities and financial and human resources.

Institutional coordination ensures effective collaboration between different administrations and stakeholders. Bilateral metropolitan and municipal governance coordination has long term positive impacts on development. The main advantage is that it allows plans to be implemented across jurisdictional boundaries, often allowing new economic dynamics to emerge. This also reduces fragmentation, inequality and spillovers, while also providing potential cost savings as a result of the creation of economies of scale.

The polycentric model<sup>2</sup> represents from the spatial planning and governance perspective, the way in which territory is ideally organized to facilitate clear definition of responsibilities and coordination amongst administrations. In order to adapt the theory to the local and physical reality, different tools and mechanisms are set into place to ensure coordination between administration bodies and other urban actors.

Given the current growth rates and urban conurbation and expansion that the metropolitan area of Port-au-Prince is experiencing, the advantages of employing a coordination mechanism at a supra-municipal scale include the joint service delivery to save costs, regional land use planning and development, economic development, improvement of fiscal inequality and rapid response to coordination needs. The different scales of the municipalities that make up the region would be reflected in the contributions and services that they would be responsible for. Different functional governance arrangements such as inter-municipal cooperation mechanisms, regional authority devolution, second level metropolitan governments and annexation or amalgamation of local governments, continue to be successfully adapted in different countries.

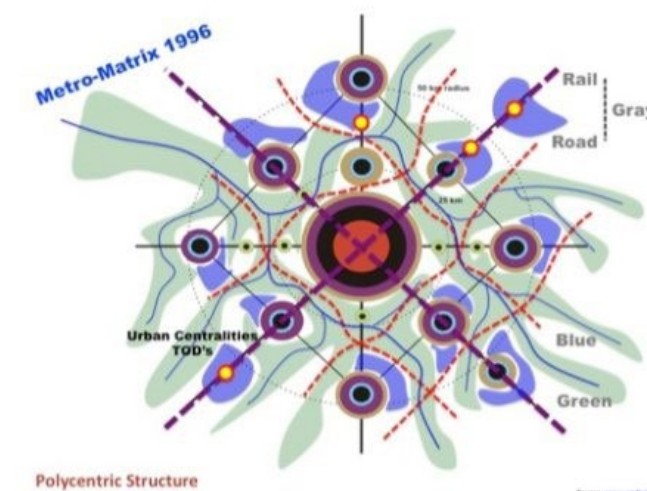


Fig.6: Polycentric Structure - (Leman, 2011-Ortiz, 2015)

## Integrated vision for the northern area of Port-au-Prince

The collectively administered vision for the northern area of Port-au-Prince implies that in 20 years time, the area will have become the most thriving zone of the metropolitan area, offering an enhanced quality of life to residents and a better businesses environment for companies to settle. More facilities, services and opportunities will be offered in an area that will be the living example of the transforming power of the sustainable development principles

### STRATEGIC PRIORITIES FOR NORTHERN PAP:

The 2040 Vision for the northern area of Port-au-Prince is summarized in the following strategic priorities, articulated through the development strategies presented later on in this development framework and implemented through the priority interventions of the last part of the document:

#### 1- Compactness

- » Promotion of orderly and effective spatial planning
- » Identification, promotion and creation of existing and new urban centralities
- » Densification along main urban corridors
- » Densification of existing urban areas inside the metropolitan area of Port-au-Prince
- » Limitation and control of urban expansion
- » Plan areas for city extension to provide sufficient land for formal urban growth
- » Reserve land for a network of public spaces to balance the expected densification of the area
- » Promote mixed land use through land use planning

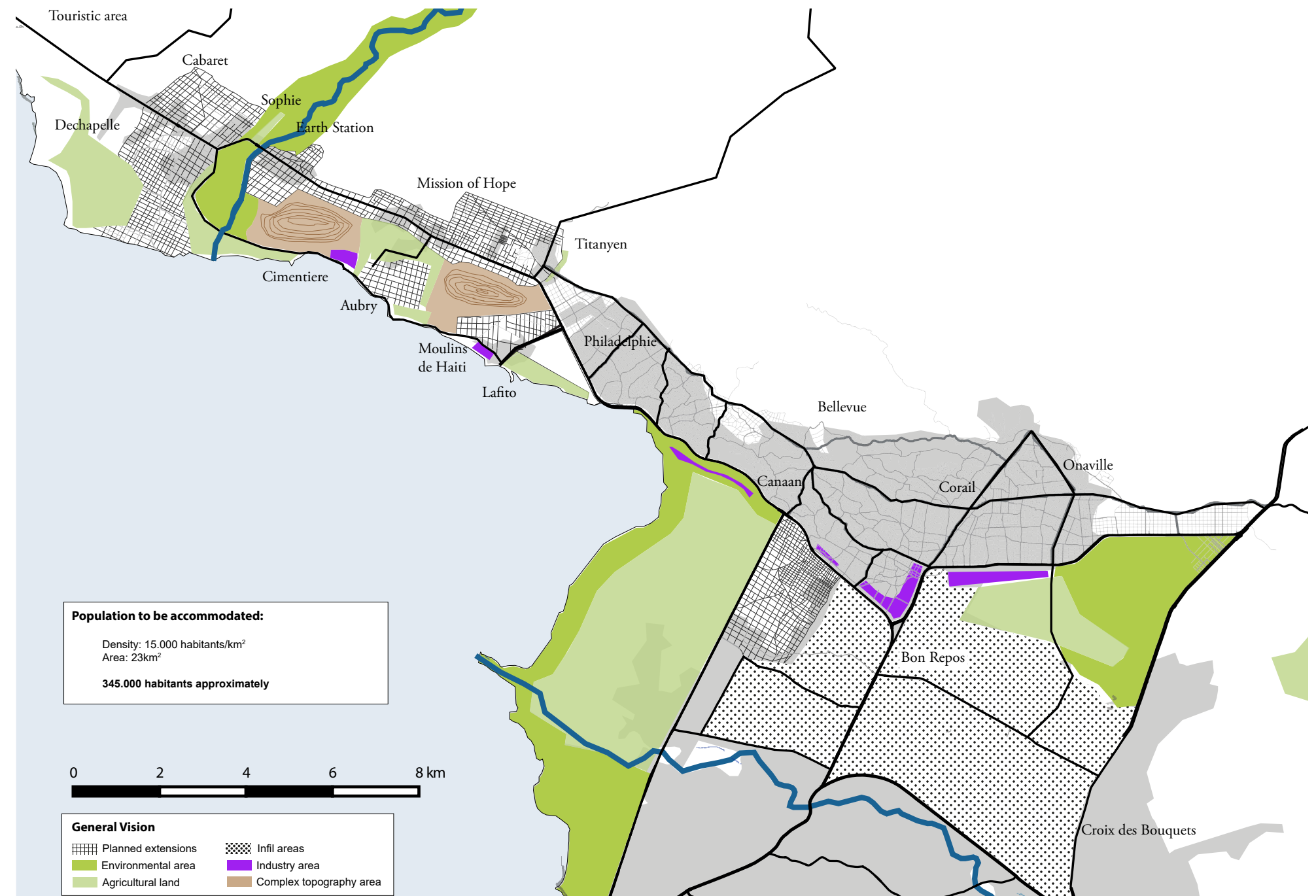


Fig.7: Integrated vision for the northern area of Port-au-Prince



## 2 - Accessibility

- » Identify and implement priority interventions in infrastructure for enhanced connectivity
- » Ensure the creation of a network of roads and streets benefiting from the grid structure
- » Ensure that at least 30% of land is allocated to streets
- » Upgrade urban areas with disconnected and disfunctional street network
- » Improve transport linkages - roads, streets, transit routes and stations
- » Design and implement a mobility strategy for the northern areas of Port-au-Prince

## 3 - Resilience

- » Promote adequate risk management through DCP and NDRMS
- » Asses the social protection requirements and develop social protection policies for the poor and vulnerable
- » Ensure the protection of agricultural land
- » Delimitation of non-aedificadi areas and relocation of residents in risk prone land
- » Design and implementation of a watershed management and drainage network
- » Design and implementation of reforestation and tree-planting strategies

## 4 - Quality of life

- » Promote and support access to basic services such as water supply, sanitation and waste management
- » Improve and facilitate access to education and healthcare
- » Design and implement through quality urban design a network of natural and public spaces
- » Improve safety and security in urban settlements
- » Enhance identity and culture through symbolic spaces and heritage preservation

## 5 - Social Inclusiveness

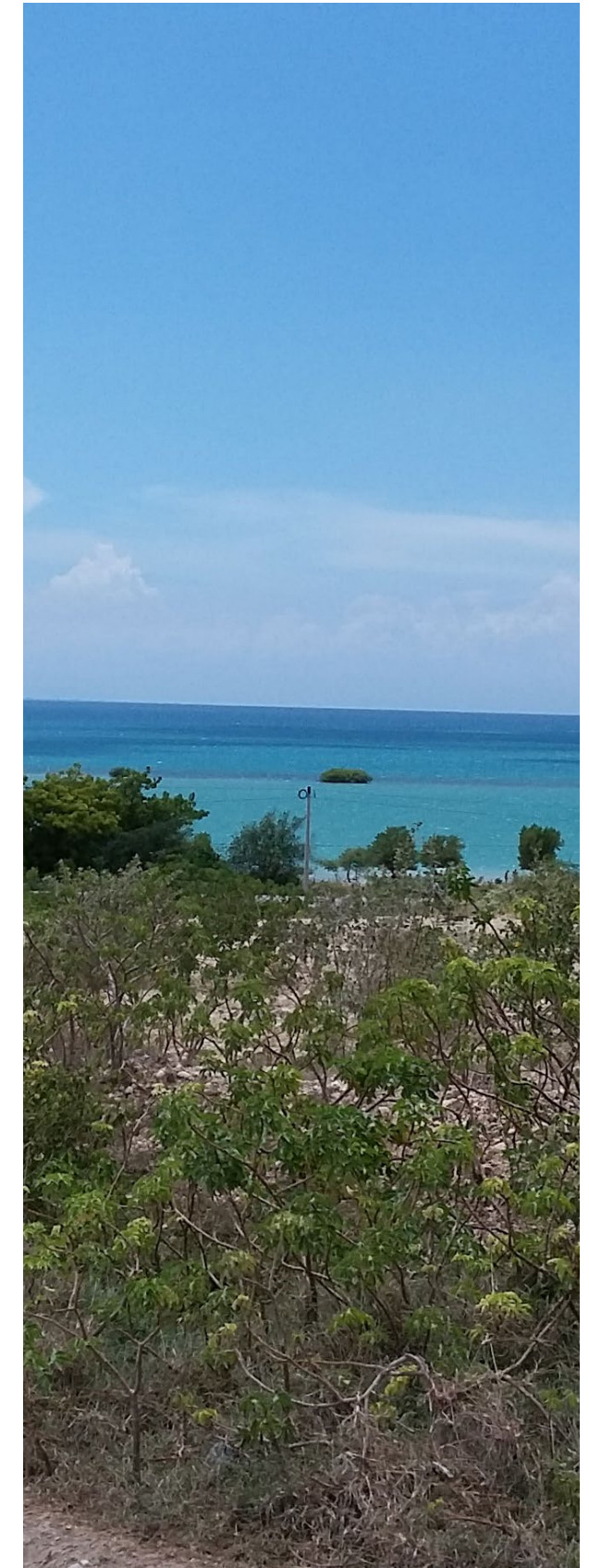
- » Boost of income generation through diversification of economic activities and policies
- » Improving provision of basic services, such as education and health and invest in basic infrastructure
- » Development of participatory planning process to include different actors and social groups
- » Develop policies to prevent displacement of residents
- » Promote the provision of a wide range of housing typologies to accomodate different social groups
- » Promote gender and pro-poor social policies

## 6 - Economic Development

- » Leverage strategic location for industrial and logistic investment, agro-processing, manufacturing, energy production, transport hubs and tourism
- » Promote land regularization and effective spatial planning
- » Improve workforce and entrepreneurship potential through capacity development
- » Enhance school system quality and promote access to education
- » Improve and promote access to infrastructure, ICT and new technologies

## 7 - Institutional Coordination

- » Prioritizing rapid-response governance mechanisms
- » Increase transparency: vertically between levels of government, and inter-sectorally between ministerial sectors
- » Provide enhanced distribution of government resources and communication methods
- » Development of new instruments for concerted action based on public dialogue, participation and public transparency
- » Exploration of new mechanisms for private-public partnerships in accordance with the local context and available human resources







## DEVELOPMENT STRATEGIES

The strategic vision components have been defined as:

- » Compactness
- » Accessibility
- » Social Inclusivity
- » Resilience
- » Economic Vibrancy
- » Quality of Life
- » Institutional Coordination

In accordance with the strategic vision, the development strategies aim to provide continuity and bridge the gap between the formulation of the vision and the implementation of concrete priority and catalytic projects.

Given the complexity of the planning activities and different priorities that have been identified, the development strategies aim at keeping the focus in the selected challenges and prioritizing seven focus areas to transform the northern area of Port-au-Prince through governance, strategic and urban planning, economic development, service provision and risk management.

**LOCAL GOVERNANCE**

**LAND TENURE**

**ECONOMIC DEVELOPMENT**

**ENVIRONMENT**

**PUBLIC SERVICES**

**CONSTRUCTION QUALITY**

**RISK MANAGEMENT**



## 1. LOCAL GOVERNANCE

Institutional and administrative structure, capacities and attributions for urbanization control and public service management

### 1.1. LOCAL GOVERNANCE CHALLENGES FOR THE NORTHERN AREA OF PORT-AU-PRINCE

The physical and socioeconomic characteristics of the northern area of Port-au-Prince and specifically of the area comprised of Canaan-Jérusalem-Onaville-Saint-Christophe can be summarized by the following:

1. The northern area of Port-au-Prince is comprised of the communes of Arcahaie, Cabaret, Croix-des-Bouquets and Thomazeau.
2. In Nord Canaan, the 15 neighborhoods occupied by 208,000 inhabitants (ARC, 2016) are developing in an area under the jurisdiction of 8 territorial authorities (three communes: Croix-des-Bouquets, Thomazeau and Cabaret) and of five 5 communal sections (2e Varreux, 1e Crochus, 2e Crochu, Orangers and Source-Matelas). However, it should be noted that the same neighbourhood can be under the jurisdiction of several territorial authorities and communal sections, as it is the case in Onaville, Canaan I, Canaan III and Bas-Jérusalem.
3. New conflicts over territorial demarcation have risen between the communes of Croix-des-Bouquets and two neighboring communes Thomazeau and Cabaret for control over the area of Canaan. It should be noted that the largest area of Canaan falls within the municipality of Croix-des-Bouquets.
4. From the perspective of territorial boundaries and urban growth, this urban area is affected by the Préval/Bellerive Governmental decree on the demarcation of public utility provisions, created for this zone in March 2010. Equally it should be noted that in December 2012, the Government of Martelly/Lamothe issued a new decree which reduced this territorial boundary which was limited to the administrative boundaries of Croix-des-Bouquets and Thomazeau.
5. The urban community of Canaan Nord is expanding in areas not formally declared to be of public utility. This growth is taking place inside the boundaries of Thomazeau and Cabaret. Most of the urban extension is taking place in non-suitable floodable and steep areas.
6. These rapidly urbanizing zones represent the most important northern acces to the metropolitan area of Port-au-Prince via the National Routes N. 1 and N. 3. As a result of the unplanned growth and the rapid demographic increase the area has not been able to grow according to any strategy or plan. A study conducted by the American Red Cross (ARC) in July 2016 shows that more than 25% of households in Canaan have established their residence there in the last 6 months.

Corail Cesseless/Camp Corail	Canaan and the other blocks
<ol style="list-style-type: none"> <li>1. Consists mostly of population displaced from the earthquake of January 12, 2010, from Vallée de Bourdon, Pétiion-ville and from Pétiion-ville club who have set themselves up in Corail Cesseless (Croix-des-Bouquets)</li> <li>2. Government and NGO-led Urban Initiative: Preparation of the occupied space (urbanisation) &amp; implementation of Camp Corail</li> <li>3. Concentration of the NGO-led interventions (combined efforts of NGOs and support to displaced peoples) : IOM, Oxfam UK, Terre des Hommes, Red Cross, TECHO.</li> <li>4. Deterioration of temporary shelters : Provision of shelters for either 3 or 5 years of occupation</li> <li>5. Early transition : Providing temporary shelters versus more permanent constructions</li> <li>6. Presence of a Municipal Annex: Set up by the City Council and the MICT at the time of implementation of Camp Corail</li> <li>7. Presence of local committees for drinkable water infrastructure management (CINE) developed by DINEPA</li> </ol>	<ol style="list-style-type: none"> <li>1. Consists of population displaced from the earthquake of January 12, 2010 and regular migrants from other parts of the country</li> <li>2. Neighborhoods span three municipalities (Croix-des-Bouquets, Thomazeau and Cabaret) and consist of people possibly from a variety of Martelly/Lamothe Government re-localization projects.</li> <li>3. Experiential urbanization conducted under the leadership of newcomers : The original leaders (elders) have managed to establish at least 100 families in the area (Martineau Metellus CUD, 2016)</li> <li>4. Community initiatives undertaken by the aforementioned leaders: Housing Development and implementation of housing, schools, churches, plot subdivisions, security forces etc.</li> <li>5. Layout of roads and public spaces, street naming</li> <li>6. Many buildings are located in flood-prone areas and /or on steep slopes that are highly exposed and at risk of landslides</li> <li>7. Presence of a Municipal Annex : A community initiative issue, and of a multi-functional bus station managed by the Association of Local Property Owners and drivers of the Plaine-du-Cul-de-Sac (APCPSC) under the authorization of the Municipality of Croix-des-Bouquets</li> </ol>

Table 3. Nord-Canaan, cohabitation of two urban realities

7. The urban area is subdivided into 4 large sub-sectors and 15 blocks: (i) Onaville & Corail, (ii) Jérusalem/Village moderne & Bellevue, (iii) Canaan (i to v) & (iv), Sources Puantes and Saint-Christophe. These sub-sectors are all connected directly to the National Routes N. 1 and N. 3.
8. Coastal land generally belongs to the state as a public utility area and presents a high level of environmental vulnerability.
9. The area of Canaan Jerusalem-Onaville-Saint-Christophe responds to two different urban rationales. Corail was established for the relocation of affected residents after the earthquake and the rest of the blocks were formed due to the rapid migration of residents to the area looking for affordable residential land (see Table 3). The area was also shaped by the intervention of several NGOs such as Habitat For Humanity, TECHO, Oxfam Italia, Mercy Corps, Global Community and American Red Cross and UN Agencies such as IOM and UN-Habitat.

The community of Nord Canaan is a residential suburb endowed with more than 200 educational facilities and schools (ARC, 2016). With a database of almost 200 grass-roots organizations, Nord-Canaan's community groups are mostly represented on community platforms or on neighborhood committees, structures that are set up by the American Red Cross at the request of the Housing and Public Buildings Construction Unit (UCLBP). The table on the right shows the distribution of populations inhabiting different neighborhoods of Nord Canaan and in turn, the different neighborhood committees to which they belong.

Commune	Communal Area	Neighborhood	Population	Neighborhood Roundtable
Croix des Bouquets	10e les Orangers, 2e Crochus	Canaan 1	13,779	Canaan 1, Haute-Sources Puantes
Croix des Bouquets	10e les Orangers	Sources Puantes	2,989	
Croix des Bouquets	10e les Orangers	Canaan 2	12,098	Canaan 2
Croix des Bouquets	2e Varreux	Canaan 3	22,413	Canaan 3
Croix des Bouquets	2e Crochurs	Canaan 4	19,860	Canaan 4
Croix des Bouquets	2e Crochurs	Canaan 5	21,119	Canaan 5
Croix des Bouquets	2e Crochurs	Village Moderne	24,578	Village Moderne
Croix des Bouquets	2e Crochurs	Bellevue	12,916	Bellevue
Croix des Bouquets	2e Varreux, 2e Crochurs	Jerusalem	21,624	Haut-Jerusalem, Bas-Jerusalem
Croix des Bouquets		Corail Cesselesse	16,753	Corail Cesselesse
Thomazeau et Croix Des Bouquets	1E Crochus, 2e Varreux	Onaville	22,663	Onaville
Croix des Bouquets	10e Les Orangers	La Decouverte	3,979	Saint-Christophe
Croix des Bouquets		Village grace de Dieu	4,861	
Croix des Bouquets		Village des Pecheurs	8,756	
Cabaret	Se Sources Matelas	Philadelphie	ND	Philadelphie
<b>Total Canaan Population</b>			<b>208,387</b>	

Table 4. Distribution of populations by neighborhood, Canaan. Source: American Red Cross (2016)



1.2. URBAN GOVERNANCE STRATEGIES IN THE COMMUNITY NORTHERN AREA OF PORT-AU-PRINCE AND NORTH CANAAN

Governance should be based on the following two principles:

**The construction of new instruments of concerted action based on public dialogue, participation and transparency**

The Haitian legal framework of urban governance grants some functions to local authorities that are also the areas of intervention of several departmental ministers. Still, city hall remains the key body in charge of urban management. The organizational capacity assessments of the municipalities of Thomazeau and Cabaret carried out jointly by UN-Habitat and the MICT in December 2015, indicate a significant lack of normative guidelines and predefined techniques, which frame their interventions in the fields of expertise mentioned in table 5. Councils are mostly defined by a disorganized administration and informal practice.

In the sectors with a shared mandate among decentralized state institutions, and especially within the sectors of potable water, public lighting, social development, education, sports, culture and historical facilities there is an absence of formal relationships between the municipalities and the relevant competent state bodies responsible for implementing management policies for these services.

An investment plan or budget at the municipal level would highlight the weaknesses in communication methods and communal consultation, focusing on a local participatory structure that aims at identifying and prioritizing the needs of the people. This should include public services, finance projects, collective community facilities, basic services, definition of local budgetary approaches, and establishment of a system of local accountability.

The presence of several neighborhood committees composed of residents, originating in different sectors have been the source of the ongoing urbanization processes in the northern area of Port-au-Prince and North Canaan. These structures have been set up jointly by the UCLBP and the American Red Cross as a way to provide intermediation, consultation and monitoring platforms that are implemented based on the priorities of the local area and with a view of having a sustainable impact on the neighborhood.

While it is true that the effect of the decrees of 2006 on territorial authorities included certain innovations in terms of consultation and participation, the experimental new organization called the Municipal Development Council (CDC - Decree of February 1, ART.88 to 112) is very rare on a national level and must operate under the leadership of the Municipal Council. This instrument combines representatives of decentralized and devolved institutions, local civil society and external partners (NGOs). The following figures present a brief overview of the CDC, its mandate and operating mechanisms.

Principal areas of expertise identified and prioritized	Decentralized Institutions Municipal Authority	Relevant Ministerial Branch (Services decoupled from sectorial ministries)
<b>Land Use</b>	<b>Municipality</b>	<b>MTPTC</b>
1. Zoning (Ensuring public spaces)	2. Municipality	3. MTPTC
4. Highways and Transport (Public and collective)	5. Municipality	6. MTPTC
7. Land and subdivision (CFPB, Patent)	8. Municipality	9. MEF/DGI & MICT
10. Sanitation and potable water	11. Municipality	12. MTPTC/DINEPA
13. Electricity	14. Municipality	15. MTPTC/EDH
16. Community Facilities (Public markets, cemeteries)	17. Municipality	
18. Employment Services	19. Municipality	20. MTPTC/Bureau des Mines
21. Civil protection (Risk and Disaster)	22. Municipality	23. MICT/Protection civile
24. Public Security, Justice and Police	25. Municipality	26. MJSP (Ministère de la Justice)
27. Economic and Social Development	28. Municipality	29. MPCE, MEF
30. Education	31. Municipality	32. MEFP
33. Health	34. Municipality	35. MSPP
36. Natural Resources and Environment (Green Space and Public Space)	37. Municipality and local authorities	38. MdE

Table 5. Fields of expertise shared between the sectorial ministries, municipal authorities and local authorities

<p><b>Composition of the CDC</b></p> <ol style="list-style-type: none"> <li>1. Mayor (President)</li> <li>2. Secretary General (Municipality)</li> <li>3. 1 CASEC/ communal section</li> <li>4. 1 ASEC/ communal section</li> <li>5. 1 Delegate/ Organized communal sector</li> <li>6. 1 Representative/ Decentralized State Departments (Sectoral Ministers: Department &amp; town)</li> <li>7. 1 Representative/ Decentralized cooperation</li> <li>8. 1 Representative/ NGOs active in the area</li> <li>9. 3 Dignitaries (Art.89 Decree February 1, 2006)</li> </ol>	<p><b>Mandate and working method of CDC</b></p> <ol style="list-style-type: none"> <li>1. Elaboration of the community development plan</li> <li>2. Formation of technical committees and commissions</li> <li>3. Production of annual action plan and selection of authorities responsible for implementation</li> <li>4. CDC operation: Annual municipal budget &amp; support fund in local governance (Art. 88 to 112)</li> </ol>
<p><b>Structure of the CDC</b></p> <ol style="list-style-type: none"> <li>1. Executive Committee</li> <li>2. Monitoring and Evaluation Committee</li> <li>3. Technical Commissions (Agriculture, SME &amp; SMI, Infrastructure, Education &amp; professional development, Health) Art.92 Decree of February 1, 2006 SECTORAL ROUND TABLES (LEGAL CRITERIA: SECTOR)</li> <li>4. Agricultural Commission (Eg. Agricultural Round Table)</li> <li>5. SME &amp; SMI Commission</li> <li>6. Infrastructure Commission</li> <li>7. Education and Professional Development Commission</li> <li>8. Health Commission (Art 92)</li> </ol>	<p><b>Structuring of Canaan: Experience of the ARC and UCLBP</b></p> <ol style="list-style-type: none"> <li>1. Round Table for Canaan I &amp; Haute Sources Puantes</li> <li>2. Round Table for Onaville</li> <li>3. Round Table for Corail</li> <li>4. Round Table for Canaan II</li> <li>5. Round Table for Canaan III</li> <li>6. Round Table for Canaan IV</li> <li>7. Round Table for Canaan V</li> <li>8. Round Table for Bas-Jérusalem</li> <li>9. Round Table for Haut-Jérusalem</li> <li>10. Round Table for Saint-Christophe</li> <li>11. Round Table for Bellevue</li> </ol>

**Capitalizing on public-private partnerships existing in the Northern area of Port-au-Prince**

This principle explores other experiences of institutional partnerships that could develop at municipal and neighborhood levels in other aforementioned fields of expertise. To date, local experiences of service provisions in the potable water sector in the area of Canaan that have developed within the framework of a private public partnership have been identified. These agreements have been signed between residents groups and state authorities in charge of service management.

These include for example, drinking water and sanitation committees (CINE) set up in the neighborhood of Corail, by DINEPA with technical support from Oxfam UK, that operate according to their terms of reference and predefined control tools. Although there have been some problems with the operation of the water market in the area, and other more technical challenges (such as a local supply network for potable water), this has been a predominantly successful project. It is possible to say that the CAEPA Corail has been established over the last three years and has begun to expand its mandate by increasing the number of water kiosks as a direct result of the profits generated. This has the effect of sustaining local jobs created following a system of rotation between local family operators, and payments based on monthly sales volume of the water.

In addition, this program works in conjunction with other partnering initiatives implemented in other areas. It should be emphasized that the seat of the public transportation management collective is located at the main transportation intersection of Bon Repos and is run by a local organization entitled the Association of Owners and Drivers of the Plaine du Cul-du-Sac (APCPCS), which exists under the mandate of the Mayor of Croix-des-Bouquets. This association currently manages a fleet of around 130 buses and vans serving 8 routes spanning between Carrefour, Bon Repos, and the different neighborhoods of Canaan (Corail, Jérusalem, Canaan, Onaville, Tente Blanche) and other inter-urban routes like Gérald Bataille, Mirebalais and Hinche. The association also provides other services related to the storage of goods and legal assistance to property owners and drivers involved in road accidents.

Table 6. Fact sheet on existing legal provisions of the Municipal Development Council (CDC) and identification of neighborhood round tables of Canaan

## 2. LAND TENURE

Institutional and administrative structure, urban management (urbanization control, public services management, etc.) local finance

### 2.1. DESCRIPTION OF THE PROBLEM AND OPPORTUNITIES ADDRESSED:

Land tenure issues represent a great challenge in Haiti. Although land security is low in the whole northern area of Port-au-Prince, the area referred to as North Canaan experiences the greatest challenges in terms of tenure and land security. After the earthquake in 2010 the Haitian government declared an area located in the northern area of Port-au-Prince (referred to as North Canaan) was designated as public utility land to encourage and facilitate the affected population to relocate to this area. For this reason, and also due to the availability of cheaper residential land, the area of Canaan has become the fastest growing urban settlement in the metropolitan area of Port-au-Prince and the largest built up area in the northern area of Port-au-Prince. North Canaan has been therefore described as an “emerging city.” Communities have organized the districts of Canaan, including to some extent the creation of streets, public spaces, schools, and temporary infrastructures, trading the land and investing in building houses. The population is transferring and developing sites and structures as well as providing services without formal plans or official approval. The current urban structure of Canaan is based on piecemeal construction while disregarding long-term planning.

The area of Canaan began to grow after the first and second “Public Utility” (or eminent domain) declarations on the 22nd of March 2010 by President Préval and on the 6th of December 2012 by President Martelly respectively. The declaration of 2012 comprises a more reduced area of around 46 km<sup>2</sup> and a population of more than 200,000 inhabitants. Most of the residents of the area have invested significantly in the area without having been granted any legal land ownership. The eminent domain procedure has not yet been completed by the State, which has not yet determined or paid any compensation to those expropriated.

#### *Legal Framework*

In general terms, legal framework for urban development in Haiti is scarce and its application is limited. The Law 18/07/1923 defines the conditions and particulars that need to be complied for the creation of new roads and streets. The Law 25/07/1924 regulates the way in which urban settlements can be constructed. The Law Decree 5/08/1937 established the special rules and regulations for the habitation and development of urban settlements. The Law 29/05/1963 extends on the special rules for the habitation and the development of cities and urban settlements for the development of urban planning.

There are a number of Haitian civil codes and regulations related to the construction of roads and

public spaces. Regulations that control the construction of road and public spaces are among the most important in developing a functional urban plan. Haiti currently has statutes that facilitate the creation of a “plan” for the northern area of Port-au-Prince and North Canaan. The statutes provide the groundwork that will underpin the plan under a legal framework that will ensure the sustainability and longevity of the plan.

Haitian statutes regulate the width minimums<sup>3</sup> and slope maximums for highways.<sup>4</sup> There are also regulations that inform the construction of intersections,<sup>5</sup> roundabouts<sup>6</sup> and cul-de-sacs (dead-end streets).<sup>7</sup> Lastly, there is a statute that also regulates the construction of sidewalks.<sup>8</sup> Under current law, the Haitian government, through the Ministry of Public Works, Transportation and Communication, can acquire additional land for streets through expropriation laws.<sup>9</sup>

Also, a decree from April 6, 1977,<sup>10</sup> regarding parceling of land into lots, requires approval for every new construction, including location plan, blueprint with the division into lots, measuring of density, roads, public spaces, drainage plan, public road network, sidewalks and gutters. The petitioner might send the application to the Administration of Civil Engineering, Transportation and Communication, which is a central government agency, in order to get approval. The effectiveness of this decree should allow the creation of a comprehensive land registry/land tenure based on data directly collected from the owners.

In 1986, a government decree established the Tribunal Terrien de la plaine de l’Artibonite.<sup>11</sup> The decree gave jurisdiction to the tribunal of all land disputes in a designated area, removing those disputes from the normal justice system. The tribunal not only improved the efficiency and speed of land disputes, it also provided landlords with a relatively reliable and consistent mechanism where land disputes could be resolved.

The Constitution of Haiti stipulates that local authorities are administratively and financially independent. According to the decree of February 1, 2006 regarding decentralization, urban planning and development plans are the prerogatives of cities. This means that cities may find revenue to fund public programs by implementing new local taxes or raising existing local taxes on land and property. However, the majority of low income taxpayers cannot afford such taxes.

The regulations described above provide a statutory framework for a potential plan for the northern area of Port-au-Prince and North Canaan which is essential for any plan to be viable.<sup>12</sup> The statutory framework provides critical, albeit imperfect, assurance that the future expansion of the area will be done in a way that comports with a potential plan that is mindful of future growth patterns enabling North Canaan to become a flourishing and sustainable city.



## 2.2. OBJECTIVE

*Unlock land tenure issues in the North Canaan area in order to enable formal development by providing security of tenure to residents and business*

## 2.3. ACTIONS TO BE UNDERTAKEN

### *Creation of an enabling statutory framework and governance structure*

A statutory framework is critical for urban plan implementation in Canaan, because it provides foreseeability. Inhabitants, investors and stakeholders need to have the assurance that the future expansion of Canaan will be effectively implemented according to a secured framework. The proposed plan should consider the current regulations and requirements for streets, intersections, roads and highways, and standards of construction.

### *Implementation of a land registry through a land tenure – local cadaster system*

The challenges facing the project in this area are twofold. First, the lack of a proper and updated cadaster system will severely impede any attempts at a humanitarian relocation program.<sup>13</sup> Any successful plan of Canaan will involve some displacement of citizens for the creation of roads, public spaces and general reconfiguration of residential neighborhoods. The Haitian government currently has limited statutory authority to expropriate land for public use. The power of expropriation (“eminent domain”) requires a court-ordered payment prior to expropriation. Proper expropriation and compensation requires a functioning and updated land registry, which Haiti currently does not have. As a result, any relocation program that does not incorporate an updated cadaster system will likely not succeed.

### *Informal land resolution mechanisms through conflict resolution processes such as mediation, arbitration or conciliation, to be conducted by NGOs, local leaders, civil society*

Formal land resolution mechanisms involve the Tribunal de Paix (Court of Peace) in Haiti. Usually land conflicts are addressed through the Civil Code regulations. These processes described in the Civil Code involve lawyers and urban planning experts. Therefore, regarding the expansive nature of these processes, few cases are resolved legally. Also the Law of September 5, 1979 regarding expropriation for public utility includes a conflict resolution before a specific jury is designated by Law.

Informal resolution mechanisms seem to be a better response to the North Canaan area. Mediation and Arbitration<sup>14</sup> may be conducted by family members, other relatives, or members of the community including religious institutions or neighborhood committees. NGOs may play a role in this informal land conflict resolution process. It is a less expensive and efficient means to resolve land conflicts.

The system also must account for citizens living on property or land without proper documentation or when the ownership of land is in dispute. The creation of a local land tribunal may provide Canaan with an effective, efficient and navigable alternative dispute resolution system than the one currently available. A similar system has been used in Haiti before with moderate success.

### *Financing and revenue generating activities for occupants leading to resident ability to purchase land titles*

One specific funding source may be found through in-kind contributions. For instance land contributions for streets and public spaces or development fees<sup>15</sup> should be implemented, distributed and allocated to the scale of each development. UN-Habitat’s Land readjustment tool is an example that could work in this particular context as it does not require additional costs for expropriation and does not imply the relocation and re-settlement of populations. This technique brings a group of neighboring landowners into a partnership for voluntary land contribution or sharing, joint planning and the servicing of their adjoining plots. Without being framed in such a way, it develops a pseudo-cooperative in areas where the administration is not extant for this level of organization. Allowing an equitable sharing of the costs and benefits of projects among public bodies, landowners and developers the technique and tool can be used for a variety of project aims, including densification.<sup>16</sup>

## 2.4. PREFERRED IMPLEMENTATION OR MANAGEMENT MECHANISM

The following approach is proposed as a step-by-step methodology to unlock the land tenure issue in the area of Canaan:

1. The Haitian Government verifies the property titles of the areas expropriated or affected by the illegal occupations. The evaluations and negotiations of the value of the expropriated land is done following the existing legal prescriptions.
2. The Haitian Government becomes a facilitator to finalize a sale (forced or eminent domain) and the purchase (voluntary) by the interested occupants or residents
3. The Haitian Government determines the square meter value to be paid by the occupants or residents interested in purchasing / regularizing the cadaster offered by the State. This regularization will take into account the territorial and urban planning that has been developed respecting the public space reserves and non-aedificandi areas
4. The Haitian Government implements a system that allows residents to execute regular payments to an agreed financial institution. A part of these funds will be used to pay the expropriated individuals and another part will serve the creation of a fund to be utilized in the development of the area
5. The agreed financial institutions will be selected after a public tender and for a limited amount of time. They will determine the credit level of each occupant or resident and will offer repayment windows of 20 to 30 years. The financial institution will present the payment records to the municipality, and to the neighborhood committees, as representatives of the occupants / residents. The financial institution will notify DGI once the total amount of the purchase has been paid by the occupant / resident for a final legal transmission of the property title
6. The municipalities, as recipients of a part of these resources allocated in the fund, is committed to reinvest this funds in the development of the area on a transparent way and guided by the decisions of the Administration Committee, formed by a large majority of occupants and residents

### ***Alternative approach:***

In case institutional approaches are unable to unlock the current situation of land tenure, local parties involved in private property transactions like notaries and land-surveyors, may have the proper documentation of real estate sales in their region or locality to support this process. These documents may provide the foundation for a successful local cadaster system. An alternate tool, namely The Social Tenure Model System (STMS), is a free-access and open-source software and participatory land information system developed by the Global Land Tool Network of UN-Habitat. Data regarding land can be registered by the community itself using this tool. The participatory database collects data about community networks while collecting data about land. The Social Tenure Domain Model (STDM) has been employed in many different countries where it “has helped the residents to assert the existence of their settlements and to move ahead towards recognition and security of tenure which have been challenging for most informal settlements”<sup>17</sup>. Community members are able to use and interact with the STDM system and can manage and update the information confidently. Data analysis has informed community plans to pursue priority projects such as roads, lighting, water and sanitation.”<sup>18</sup>



### 3. ECONOMIC DEVELOPMENT

Potential for transport, logistics, agricultural industry transformation, commerce

#### 3.1. DESCRIPTION OF THE PROBLEM AND OPPORTUNITY ADDRESSED

In its current state, the northern part of Port-au-Prince suffers from severe economic constraints. First and foremost, the lack of clear and transferable land titles presents a high risk for investments in the area, threatens the security of households and businesses, serves as a disincentive to quality construction and development, and undermines access to finance. The lack of access to finance is constricting the pace of development and constraining the ability of local businesses to invest in the development of the area.

Infrastructure and services are also impacting economic activity in the area. The poor quality of roads and drainage impedes the movement of people to jobs and goods and services to the northern area of Port-au-Prince, presenting both time and cost barriers and restricting access during the wet season. The area's continued development without internal connectivity also presents a threat to broader economic activities by adding to congestion on the adjacent national highways.

The lack of public services is a major constraint to the wellbeing and business operations in the area, with inadequate access to water and electricity taking a daily toll on economic activity. Additionally, the lack provisions of services has lead to the effective abandonment of many residents by the formal spheres of governance leaving communities to manage and govern themselves without access to institutions and legal frameworks.

Without addressing these restrictive barriers, the physical development of the northern part of Port-au-Prince will continue to drag along at a pace that does not keep up with the needs of its population, that bears the burden of tenure, housing, environmental and business risks themselves. Business activities continue to provide incomes barely above subsistence levels and housing quality will remain substandard; in short, quality of life will remain low.

However, an alternative scenario where the barriers of land, finance, infrastructure and public services are addressed is possible. In such a scenario, the northern area of Port-au-Prince has significant potential to develop rapidly and generate value for its residents, becoming a thriving and attractive part of the Port-au-Prince metropolitan area economy.

#### 3.2. OBJECTIVE

The objectives for the economic development strategies of the area are two-fold:

First, to remove economic barriers and establish an enabling environment for the sustainable development of northern Port-au-Prince which can result in value creation, improved livelihoods, and a higher standard of living.

Second, to better integrate the area with the wider economy and help it become established as an economic asset in the metropolitan area.

#### 3.3. ACTIONS TO BE UNDERTAKEN

##### Achieving Objective 1

In order to establish an enabling environment for northern Port-au-Prince's development, four fundamental elements must be addressed by the public sector:

- » Land regularization
- » Orderly and effective spatial planning
- » Infrastructure and service provision
- » Entry of responsive governance

These public actions will set the stage for markets to respond through improved financial access, increased construction and development, and the growth of a well-served livable community. It should be noted that there is an inherent risk any time public investments enter a previously disadvantaged area: that residents of the area will be displaced, either through legal evictions or by market forces (i.e. if they can no longer afford to live there).

Even when displacement happens by elective sales, there can be negative impacts. Rapid displacement can tear apart long established communities which have important social and economic functions. Selling may also be a bad financial decision, particularly if owners sell early on in the development process. Purchasers frequently have more information and more power in the transaction, which can result in below-market low sale prices that will only benefit the sellers in the short term, and mean that in the long term, sellers must find a housing solution which will almost certainly be located in a less advantaged area. Such a process means that the beneficiaries of public improvements will be sometimes predatory real estate buyers looking for quick profits made possible by public investments. Therefore, a fifth public action is needed to mitigate this risk: **policies to prevent displacement**.

Such policies can take various forms. Preserving affordable housing is a key element and can be achieved by setting aside land for subsidized affordable housing or public housing initiative, requiring new developments to contribute toward affordable housing in the area, or assisting residents to stay in their homes while generating rental income from additional space on their property.

Education and information for existing residents is important, in order to apprise them of the benefits of staying, economic options to do so (such as renting a portion of their property), and ways to get a fair price should they choose to sell. Public finance instruments such as a tax on speculative behavior or a tax on capital gains from property sales can also prevent displacement by reducing windfall profits to private developers and thereby lowering incentives for predatory behavior.

As the private sector responds to the creation of an enabling environment, the construction and finance industries may benefit from the assistance of NGOs in the area in order to respond to the changing development landscape and upgrade the services provided to match potential demand. NGOs are already working to provide construction training and expand the sector's access to business services such as marketing and financial planning, with potential for expanded activities in the near future. Caution should be taken in this area to facilitate skill development and establishment of private enterprises to deliver business services and avoid NGO competition for market share in this area.

The local barriers to both small business and personal finance are severe, but have the potential to be reduced when land titles become formalized. NGOs are working to develop financial literacy of the local residents, a critical step toward financial access.

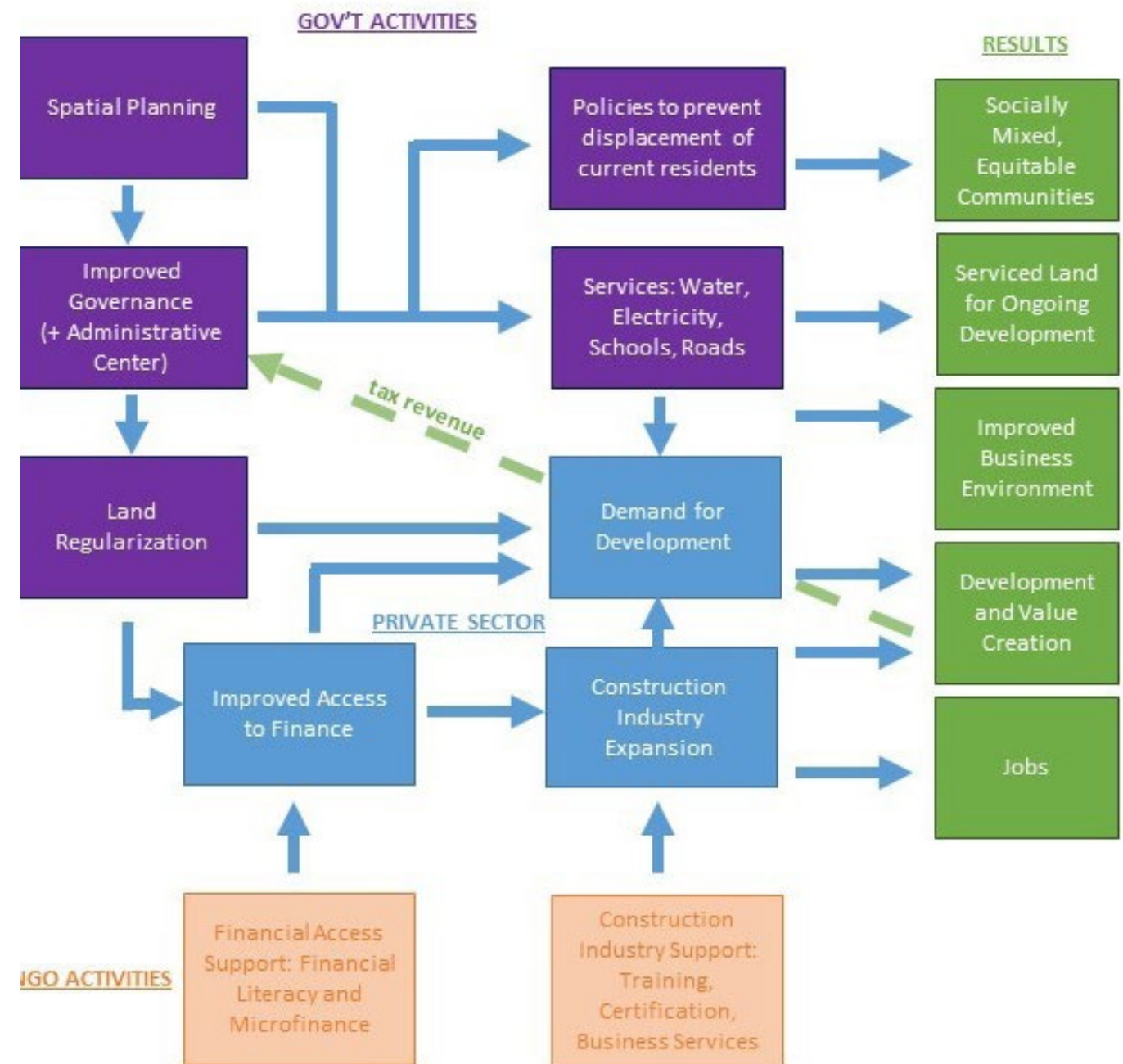


Fig.8: Flow-chart visualization of priority actions to be undertaken for economic development

## ACHIEVING OBJECTIVE 2

A number of strategies can facilitate the economic integration of the northern area of Port-au-Prince with the wider economy as an economic asset. Strategies must fundamentally strengthen and protect physical linkages to external economic poles, including roads, transit routes and stations. This will enable the movement of both labor and goods, supporting the integration of northern Port-au-Prince into broader value chains. Secondly, the potential of the area's labor force for productivity and entrepreneurship can be strengthened by improving schools and vocational facilities within the region, as well as providing expanded access to information and communications technology (ICT).

Lastly, northern Port-au-Prince's potential as a growth pole at the strategic juncture of national transport routes could be developed through strategic investment in industry in or near the area. One possible sector which provides many advantages for workforce development, improved value added for the larger economy, and increased food security is agro-processing. The whole area has the potential to develop into a location with comparative advantages for such activity since it is located at the juncture of agricultural areas, Lafiteau Port and Port-au-Prince.

To summarize, the objective of fostering Canaan's integration in and value to the broader economy can be achieved through three types of activities:

- » Improving transport linkages – roads, transit routes and stations
- » Improving workforce development and entrepreneurship potential through better schools, vocational centers and expanded access to ICT.
- » Leveraging Canaan's strategic location for larger scale industrial investment, potentially in agro-processing.

## Phasing and the role of Catalytic Projects

Many of the activities recommended above will take many years to accomplish, and some may only be feasible to begin in the medium to long term. Generally, the development of the area, particularly related to infrastructure and service development should be phased to match population growth and available resources. However, there are some immediate term priorities that can jump start the development trajectory towards economically beneficial outcomes. Specific catalytic projects can bring about quick wins and set the stage for continued economic development. Table 3.4 below lists several of these catalytic projects in the third column. They are situated within the broader strategies to address Objectives 1 and 2 as discussed above.



3.4. PREFERRED IMPLEMENTATION OR MANAGEMENT MECHANISM

Activities	Lead organizations	Potential Catalytic Projects	Recommended timing	Management note
<b>Objective 1: Enabling environment for Canaan's sustainable development</b>				
(1) Land regularization	CIAT and DGI		Immediate	
(2) Spatial planning	UN-Habitat		Already in progress	Need mechanism to ensure information dissemination and compliance
(3) Infrastructure and service provision	Global Communities	Major east-west road; critical north-south linkages	Catalytic projects should be implemented immediately; Additional services should be provided to match the pace of population growth	Need way to bring local communes and service providers into the process and help them be responsive to community.
(4) Responsive governance	?	Administrative Center	Short-term (0-3 years)	Can be combined with commercial development and privately managed
(5) Policies to prevent displacement	DGI and local communes		Short or medium-term (0-6 years)	
Support to construction sector	Habitat for Humanity, NGOs	Construction Center or Depots	Short or medium-term (0-6 years)	

Support to finance sector	Mercy Corps, NGOs	Public meeting spaces (ex: shaded areas in parks)	Catalytic projects in short-term (0-3 years); incremental improvements to financial access over the long term	Money transfer service and eventually a finance institution (bank or microfinance) can be located in the Administrative Center.
<b>Objective 2: Economic integration of Canaan</b>				
(1) Improved transport linkages	MTPTC	Improvements to Bon Repos Market; Establishment of an internal station and market	Bon Repos project in short-term (0-3 years); Internal market in the medium term (3-6 years); Additional transport linkages to Port-au-Prince in medium to long term	
(2) Improved schools, vocational centers and access to ICT	Ministry of Education		Should be provided at a pace to match population growth	Internet café can be located within the Administrative Center
(3) Industrial development hub	?	Agro-processing logistics hub	Medium to long term	Requires market assessment, recruitment of investors and buyers, scaling up of agricultural production

Table 7. Objectives, implementing partners, catalytic projects, timing and management

## 4. ENVIRONMENT

Preservation and enhancement of ecological and agricultural areas and promotion of renewable energy generation through eolic and solar generation

### 4.1. PRESERVATION OF ECOLOGICAL AND AGRICULTURAL LAND

Rapid urban growth and unplanned development in the northern area of Port-au-Prince has significantly reduced the amount of land allocated to ecological preservation, biodiversity and agricultural activities. Given the strong impact that deforestation has in the increased number of natural hazards that affect the island, the preservation and increase of land allocated to environmental preservation is a priority strategy for the area.

Port-au-Prince has developed at a very low density which has increased land consumption and reduced the efficiency of use of land. Only areas that are not adequately connected through road network or high-risk floodable areas have not still been occupied inside the metropolitan area. In communes such as Cabaret and Arcahaie there is still a large amount of non-urban land that is allocated to agricultural production. The preservation of this land is crucial for the environmental balance of the area. Agricultural and ecological land located in Lafito, Aubrey and Cabaret along the coastline represent an asset for the northern area of Port-au-Prince and therefore the proposed vision for the future development of the area focuses on the identification, mapping and preservation of this land.

In order to ensure the preservation of agricultural land, the productivity of agricultural activities needs to be enhanced. Agricultural business is linked in Haiti with low productive self-employment exploitations. Preservation of agricultural land is strongly linked to productivity. In order to increase productivity access technology and inputs such as seeds, fertilizers and pesticides should be improved. Factors that would also contribute to the preservation of agricultural land are the development of adequate infrastructure, land tenure security and access to skilled human capital.

The current strategic document sets as a priority the preservation of environmental land through the following categories, that are later on reflected in the urban structure plan for the area of Canaan, designating them as non-aedificandi areas and extensively described in the urban structure document for the Canaan area:

- » Open spaces
- » Ravines, rivers and streams
- » Land for livestock grazing
- » Agricultural areas
- » Riparian areas
- » Reforestation areas
- » Quarries

In order to ensure the continuity between environmental areas (specially ravine, rivers and streams) and urban settlements particular attention needs to be set in the development of the main and secondary drainage system structure. The points of intersection between the road and street infrastructure and the drainage structure represent overlap points that need to be properly designed and implemented to ensure continuity of environmental areas and adequate connectivity of the urban structure.

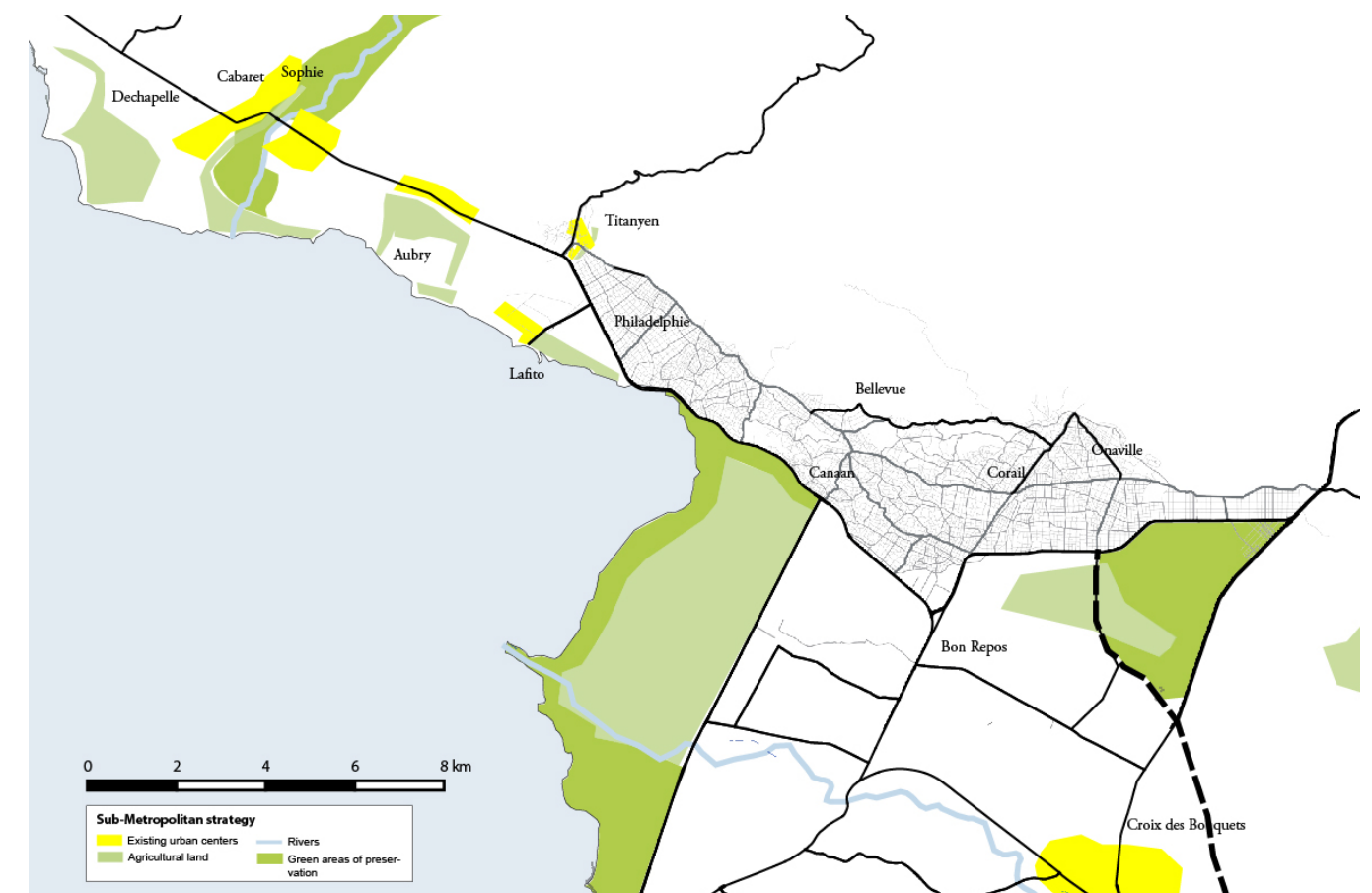


Fig.9: Preservation and enhancement of agricultural and environmentally diverse areas

#### 4.2. ELECTRICITY POTENTIALITIES IN THE NORTHERN AREA OF PORT-AU-PRINCE

- » Electricity is a major constraint to the northern Port-au-Prince economic development. Currently only 10-20% of the population has a connection, and these typically only work in the evening, with frequent and ongoing outages impacting households and businesses.<sup>19</sup> This is linked to the lack of access to technology (computers and phones) which was cited as the number one barrier by business owners in northern Port-au-Prince and Canaan.<sup>20</sup>
- » Any major economic development initiative would need to tackle availability and cost of electricity. This is particularly true for any potential industrial or agri-processing park, where the price of electricity will play a major role in determining whether Haiti is a viable location for such economic activities.
- » The average cost of electricity in Haiti was estimated at \$0.35 per kWh in 2012, much higher than the US average of \$0.10 per kWh.<sup>21</sup>
- » The U.S. Government made a large investment in energy (USD 20 million) to power the Caracol industrial park and surrounding small communities. However, the power plant burns heavy fuel oil and would have major environmental sustainability problems for scaling up that type of plant to serve Canaan's population.
- » According to a 2015 report by the International Renewable Energy Agency, onshore wind and solar are becoming very competitive in terms of long-term costs, and these costs are continuing to fall.<sup>22</sup>
- » In a 2014 report done by the Worldwatch Institute in coordination with the Ministère des Travaux Publics, Transports, Énergie et Communications entitled Haiti Sustainable Energy Roadmap the potential of green energy sources in Haiti are examined.<sup>23</sup> According to this report, Canaan has exceptional potential for both solar and wind energy generation (see maps below).
- » The energy needs of Canaan can be forecasted using population projections. Currently, Haiti has very low energy use per capita. However, our projections can assume that Canaan's future per capita usage will be closer to that of neighboring countries. The resulting energy use and cost of wind and solar are shown in the table below.

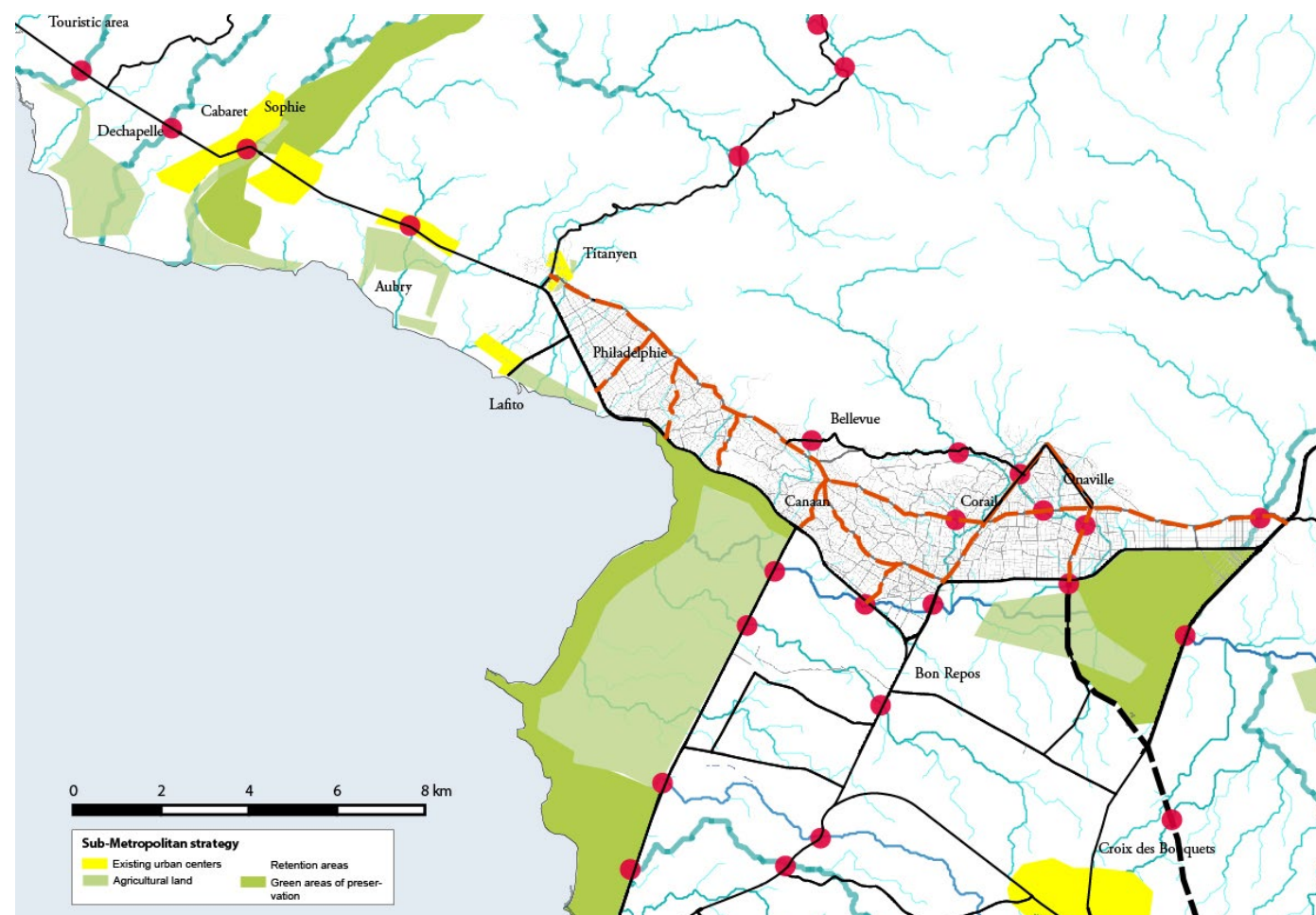


Fig. 10: Overlap areas at intersections of water catchments and road infrastructure



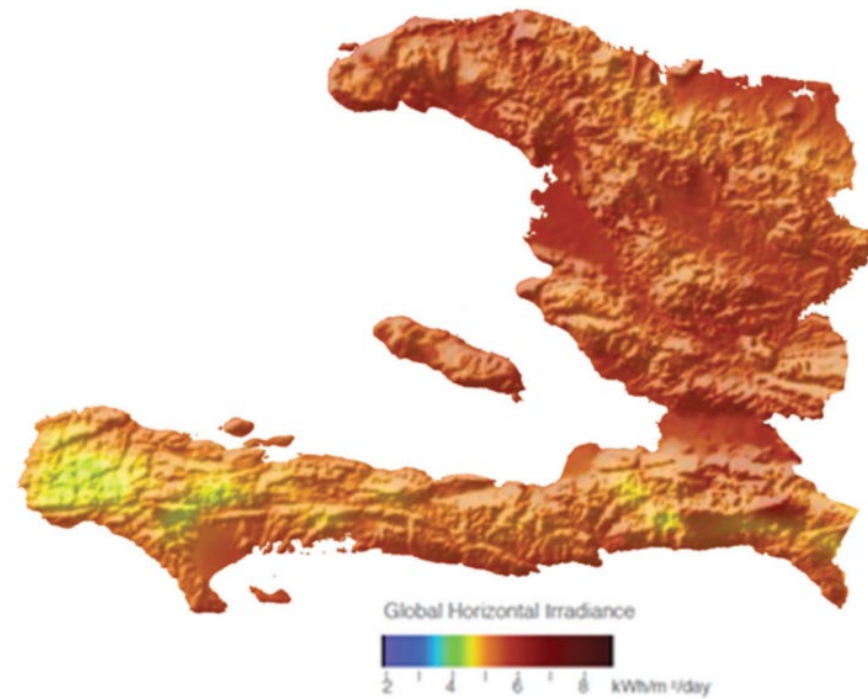


Fig.11: Solar potential. Haiti

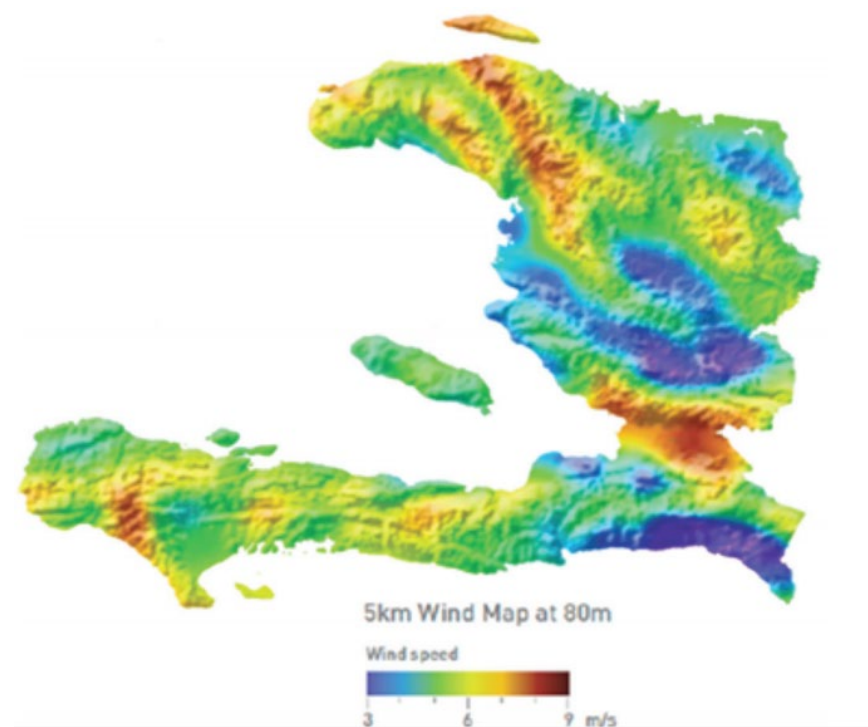


Fig.12: Wind potential. Haiti

- » Solar is more easily deployable at smaller scales, but wind is much more affordable at a large scale.
- » The area needed for either wind or solar is large. Some of this area could potentially be accommodated on Canaan’s upper slopes, where housing development is not advisable. However, the noise and health impacts of wind turbines should be reviewed before placing turbines in close proximity to Canaan’s residential areas.
- » While the costs of investment shown here are very high, if customers paid at the competitive rate of \$0.10 per kWh, a loan for a major wind project at 6% interest could be repaid in less than 9 years, including the cost of transmission lines.
- » Agencies such as the Inter-American Development Bank, USAID, and CIDA might be interested in funding or financing a major wind project, given Canaan’s very high wind generation potential, the economic potential possible, and the situation facing Canaan.

**Projected Energy Needs and Cost of Wind and Solar for the northern area of Port-au-Prince**

Year	2020	2040
Canaan population	300,000	800,000
GWh needed	283	754
<b>WIND ENERGY</b>		
Turbines needed	40	108
Km2 of turbines needed	2	5.4
Cost, not factoring in economies of scale	\$ 141,502,146	\$ 377,339,056
<b>SOLAR ENERGY</b>		
175 watt panels needed	1,413,000	3,768,000
Km2 of panels needed	1.88	5.02
Cost, not factoring in economies of scale	\$ 423,900,000	\$ 1,130,400,000

Table 8. Projected energy needs and cost of wind and solar installations for the northern area of Port-au-Prince

## 5. PUBLIC FACILITIES

Potable water, sanitation, solid waste, health, mobility, education, public space

### 5.1. POTABLE WATER

#### Water Supply Situation - Resource

The northern area of Port-au-Prince and North Canaan relies on several types of sources for its water supply, but the largest contribution is from underground water. Ground water is pumped with hand-pumps and a limited number of motorized wells. There is also water pumped from boreholes located outside of Canaan. The closest one feeds a small network operated by CAEPAs. There are more boreholes located further on the same plain ("Cul de Sac" area), some of them feeding Port-au-Prince water networks, others being used by private water companies for water-trucking. The actual number of water trucks delivering water is unknown, so it is difficult to assess the total volume of water currently "imported" to Canaan by trucks. At least 12 wells exist near Canaan on either side of the national road and south of the Olympic park. They were used for irrigation (around 320 feet deep, 600-1500 gallons per minute yield).

#### Distribution

The following list outlines the complexity of the multiple ways of distributing water from resources to consumers in the Canaan:

- » Water trucking: around 12 small companies operate trucks supplying water to households and branded distribution points from boreholes located outside of Canaan.
- » Branded distribution points: this supply chain is usually fully operated through local companies (e.g. Eau Miracle, Freché Locale, YOYO) that supply their water to franchise-type distribution points which are built, equipped, owned and operated by individuals who sell water for a living. These distribution points are equipped with reverse osmosis treatment facilities which are supposed to continuously deliver drinking quality water.
- » DINEPA network (house connections and kiosks): in 2012, OXFAM funded this supply chain in Camp Corail where 18 kiosks are supplied with water every other day. A CAEPA operates the network and has expanded it through the building of two additional kiosks. There is also an unknown number of household connections (some of them unauthorized).

- » Resale to neighbors: It is typical that households that obtain water from one of the previous sources and have a large home storage sell (or sometimes give) water to their neighbors who come to collect water with a bucket (5 gallons). This can be done through payment per volume or per month and can be considered as a micro-scale business.
- » Handpumps, mostly donated by international organizations (Living Water International, AOV International, Walk4Water, Healing Hands International, Churches of Christ in Haiti), are spread within the urban area and frequently used, though water quality is unknown. There is also a spring in the area, which can also be
- » Roof rainwater collection. Some households use rainwater harvesting which is limited by water quality and equipment (expensive system components, no storage barrels easily available).

#### Optimization: Quick-Fix Solutions

- » Option 1: secured storage facilities for households. Using smaller-sized storage facilities would require the purchase of a large number of new barrels (including the covers). Secondly, the most needy households would have to be identified. The barrels would then be sold at a discounted price to households. This benevolent strategy is a quick fix, but does little to empower locals to access water themselves.
- » Option 2: water treatment improvement at distribution points. Most water supply points in Canaan have uncertain treatment standards and handpumps trucks also provide untreated water. Water quality from trucks is also uncertain. Chlorination can help to ensure water quality, but this method is more often employed in rural areas.
- » Option 3: distribution of chlorine tablets. Chlorine tablets are currently found at local shops in Canaan, and therefore simply distributing them could reduce the economic viability of independent shop owners. As the vast majority of households use unsafe tanker truck water for drinking, encouraging more proliferation of chlorine tablets could lessen incidence of infection.

- » Option 4: distribution of water filters at household level. Many different types of water filters are available and range in characteristics, treatment efficiency and type of pollution treated. For Canaan, ceramic filters that stop bacteria and amoeba would be appropriate.
- » Option 5: improvement of hygiene and household treatment through communication. Education has been a major factor for improvements in hygiene practice among Haitians. New communication programs are an example of a 'nudge' that could be used to ameliorate issues of hygiene even further would be to equip the water basins with handpumps so that residents do not have to open the lids, throw buckets in and lift water out of the basin. Education alone must always be coupled with sanitation improvements.

**Optimization: Medium to Long-Term Solutions**

- » Option 1: conceptualization of improved water distribution network.
- » Option 2: support to water trucking

**5.2. SANITATION**

**Access**

A vast portion of the current population of Canaan (38%) has no sanitation system at home. This number is better than for the rest of the urban areas in Haiti (55%). Among this population without sanitation at home, 41% use open defecation (whether in the woods, in a bucket or a plastic bag). This score is much higher than in the rest of urban Haiti (around 20%). 49% use their neighbor's latrines and 6% use collective latrines.

N°	Option	Cost	Benefit
1	Storage subsid-ing	1500 USD/household for 3500 gallons storage.	Access to water at 2.5 gourdes per gallon instead of 6 (4 cents instead of 10). Investment becomes profitable after 9 truckloads. Potential for resale to neighbors. Potential for rainwater harvesting.
	Storage subsid-ing	27 USD/ household for one 55 gallon barrel	Potential for rainwater harvesting. Storage available for several days, reducing the frequency of trips to distribution points.
2	Water treatment at distribution points	50 USD/ treatment point for the device. Chlorine must be purchased additionally (around 0.2 USD/household/ month).	Improvement of water quality. Similar program in Kenya raised the rate of chlorinated from 2 to 58%
3	Distribution of chlorine tablets	Around 0.2 USD / household / month for chlorine tablets only	Improvement of water quality
4	Distribution of water filters for households	75 USD / household, depending on the model used. Limited O&M costs.	Improvement of water quality
5	Communication	Ranging from 40,000 to 200,000 USD depending on the extent of the action	Support to all other options

Table 9. Cost/benefit analysis for each quick fix option in water supply - SOURCE: HYDROC Consult



### Optimization: Quick-Fix Solutions

- » Option 1: *Collective latrines*. There are a few successful examples of collective latrines that could be applied in Canaan Area. One is the “bloc sanitaire” built by the NGO “GRET” in tête de l’eau area in Pétiion-ville, a southern suburb of Port-au-Prince. It was built in 2012 with the idea of providing sanitation and other services to an area surrounding a market. With a large population coming from outside staying there for a short time, the merchants, mostly women, earned a solution for their physiological needs.

Dealing with other contingencies, this bloc must have an appropriate septic tank. Treatment could be done locally if there is enough space for it, but emptying by truck should be the main option. The location of this bloc should be selected according to the 3 points above, ensuring success of then project, and not specifically to make local treatment possible. The program will include some training and sensitization of the committee in charge of maintenance. They must be aware of the importance of hand washing, keeping toilets clean, and of the overall operation of collective latrines. They must have sufficient capacities in accounting and monitoring of a small-scale public facility.

- » Option 2: *Improvement of household sanitation through communication*. Development of sanitation can be done by promoting good practices and raising awareness towards the benefits of an appropriate sanitation facility. Communication activities can be considered as a stand-alone project, but should preferably be implemented in parallel of a main project with tangible objectives.

### Optimization: Medium to Long-Term Solutions

- » Option 1: *Sanitation zoning*. Proper zoning in accordance with the ISUP for Canaan would enable the identification of areas depending on the most appropriate sanitation system to install (sewer, condominal sewer, septic tanks, VIP latrines, community latrines, ECOSAN). This would depend on population density and willingness to pay, water availability, topography, and resource protection.
- » Option 2: *Support to local market for improved latrine construction*. To reduce the price of a latrine, to improve the protection of the resource, and to increase the overall satisfaction of families with their sanitation systems, general capacities of masons must be improved. This will be done through both in-hands and academic training. Masons must learn new techniques, but also understand what it means in terms of resource protection and durability of the latrines.

- » Option 3: *Support for equipping households with septic tanks in critical areas for resource protection*. Within certain areas all households would be equipped with septic tanks. The tank is isolated from the soil where wastewater is stored and undergoes a preliminary treatment through the development of anaerobic bacteria. With a septic tank properly maintained, wastewater does not infiltrate the soil and contaminate the water table. Out-flow can be sent to a secondary treatment area such as wetland, but in urban areas such as Canaan this is not possible. Thus the septic tank would have to be emptied frequently by a desludging truck.
- » Option 4: *Small-scale sewer systems*. Small-scale sewer will address many of the issues that an informal settlement faces. A small-scale (or ‘condominal sewer’) consists of a reticulat-ed network of small-diameter pipes, connecting several households to a unique, big septic tank. This septic tank serves as preliminary treatment and must be emptied regularly. This intervention would consist of targeting areas with cohesion and similarity between households. The areas must also have a slope to facilitate movement of effluent. Additionally, permanent access to water is imperative.
- » Option 4: *Planning of a large-scale sewer with treatment site*. The planning of a formal sewer could be useful in the future when a drastic change in the context of Canaan will make it possible. A large scale sewer system requires significant operation and management capacity that doesn’t currently exist in Haiti, being the main reason to delay the development of this approach. The choice of priority areas will be done as follows:
  - Located downstream, directly next to the intended location of treatment plant.
  - Densely urbanized, resulting in a difficulty for households to find space for an individual sanitation system. The existing one are unsatisfactory, difficult or expensive to empty, making it more attractive for inhabitants to connect to the sewer system.
  - Not subject to frequent flooding. Flood risk areas represent an additional difficulty that should be tackled at a later stage.

### 5.3. SOLID WASTE

#### Collection points for solid waste

The most pressing challenge for the area of Canaan in terms of waste is the absence of collection points. This leads to a significant number of ad-hoc deposit points for solid waste, where it is not sorted and left to decompose. Some solid waste is also burnt which is clearly unsustainable. The establishment of a landfill will be a beneficial however, only be a beneficial medium-term solution if coupled with waste sorting tactics that has a positive affect on the socio-economic outcomes. In the mean while, neighborhood collection points must be established to introduce the concept of waste management at a local level. This has the potential to affect the larger understanding of the Canaan area, but this must be carefully planned in conjunction with communication programs.

#### Recycling as an economic booster

On an island such as Haiti, solid waste products that contain a variety of recyclable and raw materials have a high resale potential and contain embedded value that if extracted properly can aid with the challenges of both waste management and employment. Although education, capacity building and communication are essential for addressing this type of intervention, the potential for affecting the promotion of other areas of sustainability is high. Principles of the circular economy should be introduced through a variety of avenues. The first step would be to set-up several strategic nodes for waste management centers, ideally one per neighborhood, but to begin a pilot of three distributed equally throughout Canaan. These areas should be ideally located adjacent to main transport hubs. The pilot project would employ between 10-30 people per waste management center in jobs of sorting, separating and material extraction.

#### Organic Waste Treatment

Organic waste treatment could be a next step towards a more sufficient, but as it makes up the bulk of waste volume for Canaan, (as per the table below). Installing a series of small organic waste-treatment facilities could prove to be a viable option, only if coupled with communication strategies. Another option is to have home-based composting facilities, although this would clearly be the highest cost option. As either of these possibilities comes at a high financial cost, communication about waste separation is a good first step to ensure better decomposition in the landfill.

#### Promotion of Composting for small-scale agriculture

One of the areas that has the largest potential for rapid change, is the introduction and promotion of composting for organic waste from agriculture. This must be done on a piecemeal basis by identifying key farms for piloting the intervention that have influence among other farmers.

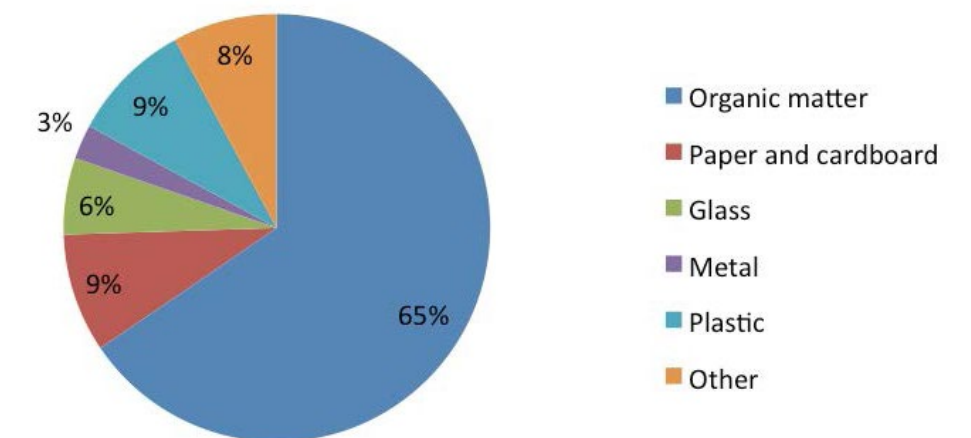


Fig. 13: Waste composition in Haiti. Source: "Haiti Waste-to-Energy Opportunity Analysis." National Renewable Energy Laboratory. November, 2010.

## 5.4. HEALTH

### **Expand the coverage, utilization, and quality of health care services**

Although both maternal and child mortality have decreased significantly since 2000, mortality indicators remain strikingly high. This can be attributed to persistently limited service utilization and inadequacies in the coverage of basic interventions such as assisted births in health care facilities and treatment of ARIs. The shortcomings in coverage and service utilization are still accompanied by important inequalities linked to poverty, area of residence and gender. Improvements in both areas will therefore require several critical actions by the government and its development partners, including the following:

1. *Establish a localized information system for a unified beneficiary targeting mechanism.* Charging for services based on average socio-economic status of the local area is an effective pilot project in the area of Canaan specifically because of the diverse socio-economic background of the population. Developing appropriate targeting tools, including a deprivation and vulnerability index is critical. Several actors in the social protection sector (FAES, the Ministry of Social Affairs and Labor and others) are involved in the development of these tools, which will can be used to reach vulnerable populations.
2. *Focus on adapting programs with a proven record to the scale of Canaan.* Several pilot programs in the area of Canaan have focused on payment to healthcare providers according to the quantity and quality of health services they deliver. This results-based financing has the potential to improve efficiency in service delivery and the quality of care, which may encourage patients to use health care facilities. Focusing on communities is likely to expand the utilization of primary health care services among the poor (including preventive health services) and hence, reduce the risk faced by the poor of incurring difficult health expenditures so common in this type of informal settlement.
3. *Fill knowledge gaps to understand the low-usage, low-spending conundrum.* Two remarkable features of Haiti's health care system are the limited utilization and out-of-pocket spending. In facing a health problem, 55 percent of the population does not rely on public services, and households spend only 1.7 percent of their budgets on health<sup>24</sup>. These patterns raise the key question of whether the cost of the services is too high relative to the perceived quality. Among the possible determinants of low service utilization are the influence of culture on health service usage and the low quality of the services provided, especially in Canaan.

### **Develop innovative donor coordination mechanisms**

Budget allocations from external sources targeted at health-care in Haiti have generally declined over the past few years. It is thus imperative to develop better mechanisms to coordinate the many external donors to find meaningful ways to contribute to enhancing efficiency and reducing overlaps, at the same time ensuring that the government's priorities for intervention are systematically taken into account. Possible mechanisms to enhance donor coordination include establishing a well-staffed subunit devoted to donor coordination and harmonization of the relevant initiatives, adopting a sector-wide approach, and gradually shifting to pooled funding mechanisms.



## 5.5. MOBILITY

### Present Situation

The site is framed by three street axes connected to Port-au-Prince. The internal site is primarily non-paved making it difficult for vehicles to pass. The roads are not well-structured and there are few connections internally, making transport highly inefficient. However, since the majority of economic activities are found on the National Routes (RNs), motorized vehicle traffic defines the connectivity of one neighborhood to another.

The short-term vision of the area of Arcadiens, is for it to become an employment hub next to Canaan for industry, logistics and tourism.

### Common Modes of Transport

The principle modes of motorized transport in Canaan are tap-taps, buses and mototaxis. The operation of these networks is done privately, and therefore profitability is a serious concern. If motorized transport is to provide capacity for the rapidly-growing area, two factors for the profitability must be addressed:

1. Population density of the affected area and the long-term vision for the network
2. Speed for commercial transport
3. Internally in the network there is limited service for two main reasons; insufficient clientele, poor internal connectivity.

### Conditions for Ideal Mobility

The needs for Canaan stem from weak urban mobility, difficulty moving around the internal sectors between the RNs, and mobility outside of the sector completed through. In order for the ideal auto-mobility flows to be capitalized upon, several conditions must be satisfied:

1. Commercial activities should be reserved for specific areas, rather than occupying the streets, sidewalks and parking areas. Sub-nodes must be identified to spread out people's desires and needs for travel.
2. Waste collection points must be installed at specific nodes where multiple activities take place rather than where they currently are on roads (making access for collection easier, and encouraging people to attend to their commercial activities in a centralized location).
3. Roads must be maintained at regular intervals, especially in high flood-risk areas.
4. Tap-tap stops must be mandated in specific areas so that roads are not blocked by the public transport. One possibility could be public transport nodes that have bays for a variety of different nodes including multi-modal potentials.
5. Motorized vehicle parking must be set aside in tactical locations reserved on the side of streets, or in separated parking areas.
6. Traffic lights or other traffic-calming measures must be introduced including new route options to spread out demand.

### Initial Recommendations

Recommendations for mobility within the area fall under two interdependent categories. Mobility must be seen as the conglomeration of both motorized and non-motorized transport solutions leading to a state of inter-modality as the norm. Any strategy to improve motorized mobility must be coupled with improvements for non-motorized transport services (NMT). Two long-term overall goals for improving access to motorized transport include:

1. Increasing employment opportunities within the area of Canaan to reduce commuting to Port-au-Prince
2. Locate activities next to Route National 1 & 3, to reduce logistics travel (trucks) inside of Canaan

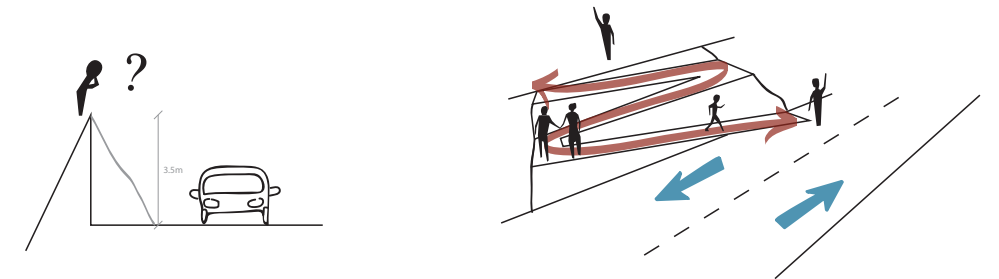
### NMT Connectivity

The strategies for enhancing local non-motorized mobility are based on the UN-Habitat principles of public space. As connectivity impacts heavily on the public realm, streets, squares and paths must be seen as an imperative part of a larger network of public spaces. The challenging topography in Canaan means that solutions for steep areas with a high risk of erosion must be strategically placed to ensure ease of movement for those without motorvehicles and access to motorized vehicle transport. The following are three examples of ways in which different topographies can be tackled to encourage non-motorized mobility internally in Canaan. These three strategies must be employed in conjunction with improvements to the road network.

#### Earth Ramps

Materials: Reinforced stone, Do-Nou Bags

Pedestrian mobility between newly built roads and housing, for lower height differences (3.5m)



#### Stair Ramps

Materials: Stone or wood, Muram (disintegrated rocks)

Pedestrian mobility between newly built roads and housing, for taller height differences (5m)



#### Public space

Materials: (Various) Stone, concrete, wood, shrubbery

Existing flat areas utilized for flexible public space increasing potential for higher density of surrounding housing

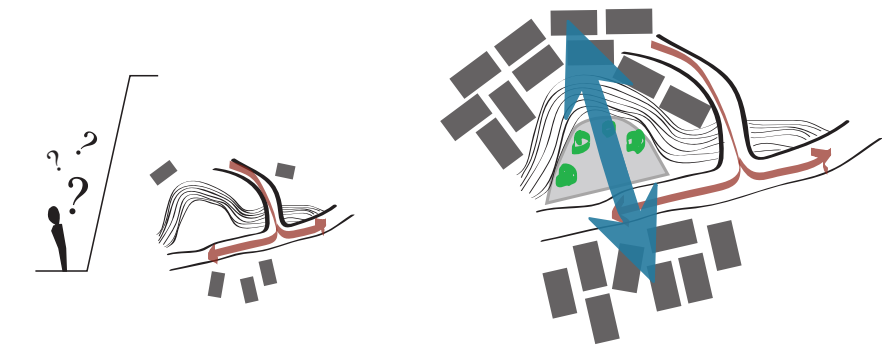


Fig.14: Connectivity for NMT (non-motorized transport services)

## 5.6. EDUCATION

### Priority 1: Sustain and expand access to universal primary education

While primary-school enrollment rates in Haiti have increased substantially in recent decades, enrollment is still not close to universal, particularly among the most disadvantaged children, including the poorest, those living without their parents, and those with disabilities. At the same time, declining donor financing and a recent decision by the Ministry of Education and Vocational Training to stop funding tuition waivers for new cohorts of first graders in nonpublic schools threatens the gains in access made in recent years. Achieving universal primary enrollment therefore requires several critical actions by the government and its development partners including the following:

1. *Produce and implement a short-to-medium-term financing plan for primary education, increasing resources available for the sector.* The Tuition Waiver Program has stopped taking on new cohorts in the first grade because donor financing through the sixth grade cannot be guaranteed. At the same time, ongoing funding for school meals has not been secured from donors. The creation of the Fonds National d'Éducation (national education fund), which is financed through international phone communications and transfer taxes, provides a new funding stream for education and has been used to support universal education. However, the fund does not appear to be sufficient to back tuition waivers, school meals and the Program for universal education. Additional resources are therefore required so that the government can eventually assume full financing responsibility over primary education. National policies and medium-term financing plans focusing on tuition waivers and school meal programs are therefore urgently needed.
2. *In coordination with social protection programs, determine medium to longterm strategic plans for service delivery by type of provider at all levels of education, starting with primary education.* The majority of schools at all levels in Haiti are nonpublic and operate with little oversight or accountability. The government has built several new public primary schools in recent years and has decided to strengthen public service provisions for primary education by no longer funding tuition waivers in private schools. More challenging is that preprimary, secondary, and postsecondary education is also largely privately funded, and strategies for increasing access to these levels within the government's fiscal constraints are limited. Because finances are cited as the main reason children are out of school, targeted cash transfer programs can serve as an incentive to send poor children to school and can help poor families pay for the associated expenses.
3. *Establish a robust information system of beneficiaries, including a targeting mechanism.* Ways of identifying beneficiary schools for the various programs offered by the Ministry of Education and Vocational Training do exist, but no centralized system integrating all programs is currently in place, nor one directly identifying beneficiary students. A robust information system is needed to avoid the duplication of efforts and to strengthen the supervision capacity of the ministry. Such a system would also contribute to monitoring the new measures adopted by the government in issuing teaching licenses and school certifications. An information system that facilitates the identification of geographical areas and schools in need of resources and that utilizes poverty data and data from social protection programs would allow the government to more effectively allocate its limited resources where they are most necessary.



**Priority 2: Improve learning and the quality of service delivery in education to avoid school abandonment**

Assessments suggest that learning is limited in primary schools, particularly in poor and rural communities.<sup>25</sup> Other indicators of the quality of education, including teacher knowledge and learning materials available in schools, suggest that many children, particularly poor children, are receiving low-quality primary education. This contributes to high repetition and dropout rates, and ultimately to low educational achievement because children with weak basic skills are unable to complete primary education and continue to secondary education or otherwise gain little from school. Increasing the quality of education offered will require the following steps:

1. *Strengthen the educational information system and collect better data on learning, school progression, and other outcomes in education.* Haiti lacks a national learning assessment system, which limits the government's ability to identify and address the barriers to basic skill acquisition. Assessments of learning based on representative samples beginning in the early grades provide a baseline for planning interventions and measuring their success. Such information would also facilitate the tracking of inequalities across areas of the country, which existing data suggest are substantial. Furthermore, it would bring to light questions such as the importance of language of instruction in primary schools (Creole versus French). Plans to pilot early grade reading and mathematics assessments on nationally representative samples, as well as recently announced plans by the Ministry of Education and Vocational Training to develop national examinations prior to the first one now taken at grade six, are productive steps toward accomplishing this goal.
2. *Increase public oversight through targeted and well-implemented measures and systematic data collection to hold schools accountable.* Several reform measures announced by the ministry in August 2014 hold the promise of increasing public oversight in primary schools. These include plans to phase in a mandatory teaching license based on demonstrated competencies; an in-service training program

for teachers; a mandatory school identity card leading to eventual certification; and ministry supervision of schools with low passing rates in national examinations. Data from learning assessments, as well as from other sources such as the school census, could also be used to inform parents about the quality of schools, as a basis for creating contract incentive systems between the government and schools, and to hold schools accountable for outcomes. These measures, if implemented effectively, would contribute to increased quality, learning, and ultimately, educational attainment.

3. *Address preprimary education to give children a solid foundation for skill building.* Investing particularly in children, especially from impoverished families, before they reach primary school is critical because malnutrition, lack of stimulation, and other deprivations are common. As a result, children enter primary school two years late on average, putting them at a substantial disadvantage in learning and educational attainment. In Haiti, preprimary education is provided mainly by the private sector and, like other levels of education, is largely unregulated. Yet, the majority of children attend at least one year of preprimary education prior to entering first grade, creating an opportunity for the government to help lay the foundation for human capital accumulation.

## 5.7. PUBLIC SPACE

### Catalytic Projects

From the discussions held with the different stakeholders during the different charrettes and interim meetings and presentations, a list of catalytic projects was deduced. These are projects that were agreed by the community as important. Bon Repos, one of the ten catalytic projects, was defined as a common concern by all groups. The area is known to be as one of the most congested places in the northern metropolitan Port-Au-Prince; especially around the transport hub and the market. With more than 200 vendors and 15 transport routes, this urban public space is in need to overcome the challenges through a sustainable approach. The space was defined by the minecraft workshop conducted with local residents and users of the space. Bon Repos provides a strategic example of how public space is to be addressed throughout the area of Canaan.

### Public Space as NMT Connectivity

Approaching the network of footpaths, ravines and streams from the perspective of mandating proper care for public space is essential to achieving cohesion among residents. Most of the current and future residents will be low to middle income earners and will need avenues for common integration into their new urbanity. The strategy combines both connectivity pathways for non-motorized transport use, and public space, as well as using public spaces as pathways for movement.

### Integrated into the natural urban fabric

Public spaces are also integrated into the non-aedificandi areas that will encourage residents to interact in new spaces with shaded areas and that will be doubly used as pathways for internal access.



Fig. 15: Bon-Repos bus station layout (left), and market layout as per minecraft intervention



Fig. 16: Illustration of possible manifestation of public space in non-aedificandi areas. © UN-Habitat

## 6. CONSTRUCTION QUALITY

### 6.1. LEVERAGING NORTHERN PORT-AU-PRINCE CONSTRUCTION SECTOR FOR SUSTAINABLE DEVELOPMENT AND EMPLOYMENT GENERATION

- » Construction is a sector with very high potential in Canaan due to the existing diversity of employment and pent up demand for housing and roads.
  - » If Canaan's Urban Development Plan is implemented there will be major investments by both the public sector and the private sector. These investments, particularly those in roads and housing, should contribute to employment and firm growth for Canaan's local entrepreneurs and workforce.
  - » Habitat for Humanity has already conducted an assessment of the value chain for residential construction in Canaan. Habitat for Humanity should play a key role in building the capacity of the industry to respond to increased demand and build in ways that are earthquake resistant.
  - » Beyond simply addressing the constraints to the existing construction value chain and improving the quality of work, there are two specific areas where the construction sector in Canaan can be leveraged to support sustainable development:
    3. The residential construction sector must become familiar with designs that allow for densification of Canaan, in order to meet population and density targets for the economic and financial sustainability of the area. Structures must be built to allow for the easy construction of additional height and/or horizontal extension. Such designs can be developed and disseminated through local construction networks. The market for densifiable designs can be developed by community messaging about the income potential of rental spaces, especially as Canaan's residential market improves.
    4. Local contractors and firms must be involved in the extensive work of road construction planned for Canaan. This will require both supply-side and demand-side interventions.
      - a. On the supply side, contractors and firms must develop the skills and knowledge for road building. They must also organize themselves in order to meet public procurement requirements. This may involve partnering with existing formal sector firms.
        - b. On the demand side, government procurement should recognize the value of hiring local contractors for work in their own community and reward this within the bid evaluation process. Extra assistance in responding to public tenders should be provided to local firms at each step of the process, including prior to the release of RfPs, and during the proposal and bidding process. The idea is to develop local firms' capacity to meet the standards of the procurement.
5. Identification and reserve of land suitable for urban development and preservation of agricultural and environmental land for the metropolitan area of Port-au-Prince
  6. Planned extension of suitable areas bordering the Canaan area and densification of areas under 15,000 inhabitants per square kilometer. The objective would be to build the new urban Port-au-Prince Nord as a network of interconnected urban settlements to foster accessibility, allow better commuting and promote higher economic productivity
  7. Improved connectivity at the metropolitan, city and neighborhood scale through the designation of the main roads and streets to be maintained, upgraded or newly built
  8. Development of a network of public spaces and block activity centers, taking advantage of the existing clusters of commercial uses and the existing commercial streets.
  9. Water management assessment and implementation to prevent erosion and reduce the impact of floods.
  10. Promotion of social inclusive developments through social housing finance programmes.
  11. Institutional arrangement between the three municipalities to define the roles and responsibilities of the three different administrations towards Canaan.
  12. Coordination of actors.
  13. Land tenure arrangements.



## 7. RISK MANAGEMENT

Addressing flood risk as a catalyst for other future disaster preparedness

Flooding in the northern area of Port-au-Prince is among the most pressing issues for maintaining a sustainable structure for the landscape. Preventing it by utilizing the existing water management structures is no guarantee of improvement. The overall strategy must be to improve drainage systems in a contextually and locally-relevant way, coupled with relocation and compensation for residents. This social aspect means that new remuneration methods must be explored to include communication as well as financial compensation. The areas for specific drainage improvement are:

### **Upstream Crossings**

These areas are susceptible to erosion and constant bank retreat where the upper parts collapse into the stream bed. Gabions should be used where the bottom is brought well below the streambed to ensure the base is not eroded. Walls should be constructed higher than maximum water levels, with increasing widths according to height. Construction of well-designed fords with ventilated concrete drifts is suggested to enable crossing during low/medium flows. Careful design of the concrete drifts is essential so that the structures withstand peak events.

### **Central River Crossings**

Erosion causes fords to become unpassable due to river bed erosion. Proper reconstruction of the ford is suggested, with a ventilated concrete drift. Slopes over embankments must be in a way so that cars can pass, and increase the height of the to upstream and downstream bank height to avoid inundation during flooding and protect road foundation against erosion.

### **Flow Splits**

When rivers fork into side channels this can cause flooding of surrounding areas since bank heights are very low and the channel is densely vegetated further downstream. A rehabilitation of both sides of the canal is necessary, being used as a secondary drainage canal, conveying water to the lower areas of Canaan.

### **Culverts along National Routes (RNs)**

Over time many culvert openings have been reduced to less than 50% of their design capacity, causing frequent flooding of surrounding areas. Immediate and continuous cleaning and maintenance of the existing culverts is necessary. To relieve frequent flooding and backwater

effects, the ravines should be excavated up to a point where cross sections can convey sufficient discharge.

### **Earthen Canals**

The route of earthen canals should be secured so no further construction occurs close to or on the canal. Canals are an important artery for secondary drainage systems. When erosion and collapsing side walls occur, one can see that canal linings are necessary.

### **Depressions**

Areas in natural depressions often don't have adequate drainage. Residents report frequent flooding that can last 3-4 days. However, the area is populated and additional construction is currently underway. From a flooding perspective, this construction and utilization of this area should be limited. Even though the area will always be susceptible to flooding and parts which are currently still uninhabited, should be designated as a park/sports/recreation area which is allowed to flood. Depressions must be connected to secondary drainage channels.

### **Upper watershed areas**

Water originating in the upstream regions of Canaan's watershed is already loaded with sediments which are carried into the urban area. Long-term measures like the increase in vegetation cover, terraces and possible reforestation should be considered. Protective measures such as fencing to prevent animals eating plants and surface protections like meshes or geotextiles, must be introduced. Additionally, paths should be constructed to guide water in additional channels. Land should be terraced and consolidated. In addition, a dam project for water storage is suggested in the upstream area.

### **Non-Aedificandi areas**

These areas are the prime locations for efforts to couple risk mitigation and the establishment of public space. Specifically, these areas are reserved as environmental protection zones. The way in which these are managed and preserved is to be done collectively with the community. Young people will be included in the development of strategies to preserve the land and introduce new ways of using the space, and adapting it to the extreme weather events.

## 8. IMPLEMENTATION STRATEGIES

Strategic Urban Development Plan, Urban Structure Plan, Neighborhood Plans and Catalytic Projects

### 8.1. DESCRIPTION OF THE PROBLEM AND OPPORTUNITY ADDRESSED

The metropolitan area of Port-au-Prince is rapidly expanding with circa 6% population growth per year. Lack of adequate planning has previously resulted in an unsustainable metropolitan growth, one that is not suitable in the long term. Due to the rapid transformation, the metropolitan Port-au-Prince will need to transform by 2035 (at an estimated current medium density of 16,500 inhabitants/km<sup>2</sup>); 195 km<sup>2</sup> of rural land will have to be converted into urban. This required amount of land is slightly larger than the current 158 km<sup>2</sup> of the metropolitan area of Port-au-Prince, which means that if the current trends continue, the metropolis will double its size by 2035.

The reason for this transformation is due to natural growth, but also, due to the metropolitan dynamics of residents moving from urban centers to the suburbs, thus leading to sprawl. For the specific area known as Canaan Nord, most of the growth has taken place from residents that lived already inside the metropolitan area of Port-au-Prince mainly due to more accessible land for renters. The southern area, along NR2 going southwest, was not planned in advance, lacking proper vision or development strategies, resulting into a congested area where economic productivity is hindered by insufficient infrastructure and service provision.

To avoid replicating the same unplanned model and in order to take advantage of the best existing opportunity to capture the economic, social and environmental opportunities present at the northern area, a shift to a more compact, connected and socially inclusive model is proposed through the Strategic Development Framework. The means to achieve this, have been elaborated in the Spatial Framework. The Spatial Framework understands land as a limited resource and proposes a shift towards compactness in order to reduce the environmental impacts of sprawl, such as higher energy consumption, reduction of biodiversity, replenishment of aquifers, pollution, land erosion, temperature increases, etc. Economic and social negative impacts of unplanned non-compact developments, are also tackled by the proposed model, reducing the costs of infrastructure and service provision, increasing the feasibility of urban management and promoting urban patterns that allow for the development of feasible economic activities for residents to improve their livelihoods.

To provide a clear structure and hierarchy to the areas of work of the Urban Development Initiative, the proposal has been structured into four main documents that respond to the four main scales of planning.

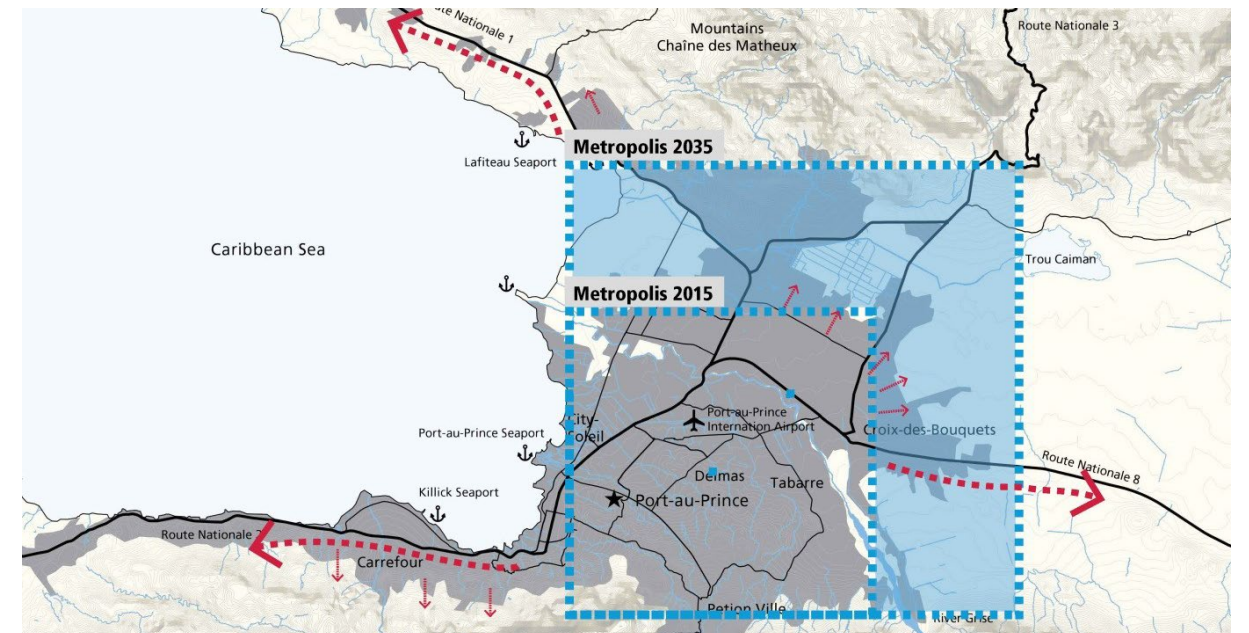


Fig.17: Port-au-Prince and Metropolitan area in 2015 and expected growth by 2035

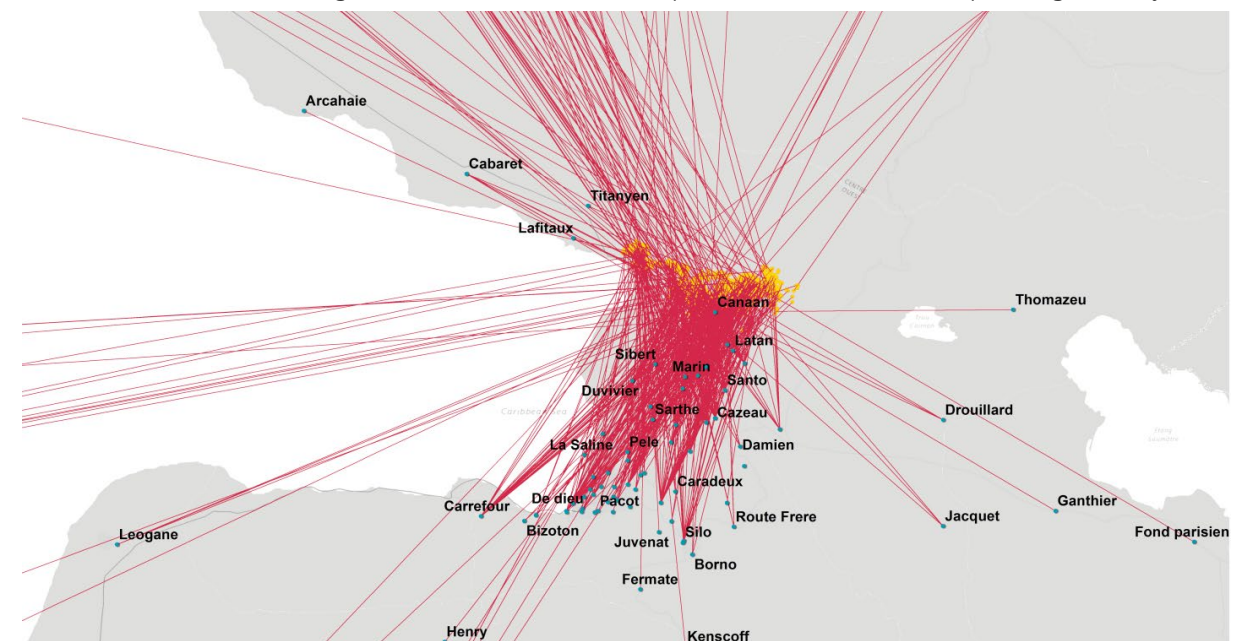


Fig.18: Metropolitan relocation dynamics. © UN-Habitat

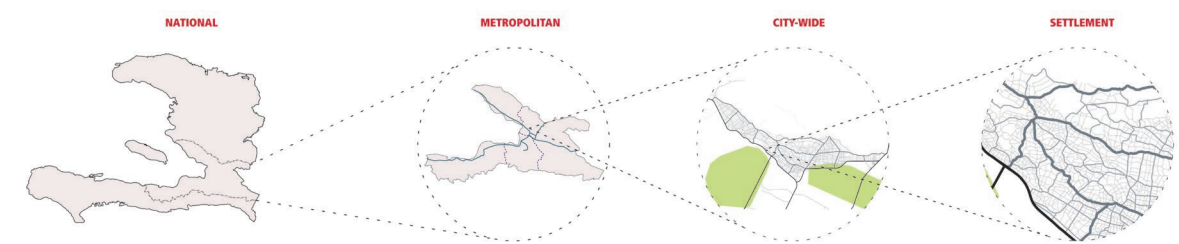


Fig.19: Different scale of work in the initiative

Analysis and Diagnostic		
Strategic Urban Development Framework	Urban Structure Plan	Neighborhood Plans
Vision Strategic Urban Development Plan		Catalytic Projects
Development Strategies		
Priority Interventions		

Table 10. Analysis and diagnostic framework

As the main objective of urban planning should always be the implementation of the proposed vision, strategies need to be clearly defined and translated into concrete interventions. The following spatial strategies, that result into priority interventions, have been formulated to facilitate implementation and avoid the creation of planning documents that are paper tigers.

### 8.2. OBJECTIVES

The objectives for the spatial development strategies for the northern area of Port-au-Prince are two-fold:

- » Involve decision makers and residents on a common platform to draft a common vision, direct implementation and support monitoring.
- » At an urban strategic or metropolitan level shift the unplanned growth that is taking place in the northern area of Port-au-Prince into a more compact, better connected and socially inclusive development paradigm.

### 8.3. ACTIONS TO BE UNDERTAKEN

Achieving objective 1 In order to bring together and coordinate development stakeholders, a number of actions are and have been developed along the planning process.

1. Participatory Planning Charrettes 1 and 2
2. Bilateral sessions with Ministries and municipal decision-makers and government officials as well as international organizations, non-governmental organizations,
3. Technical advice to influence ongoing initiatives and projects from different stakeholders
4. Joint reviews of planning documents and inclusion of main priorities and feedbacks from involved actors
5. Planning sessions with the "Tables de Quartier" of each of the 15 neighborhoods facilitated by the American Red Cross.
6. Participative public space design workshops for residents with special focus in the engagement of women and youth groups.



## Achieving objective 2

To shift towards a more compact, connected and socially inclusive northern area of Port-au-Prince the following actions have been identified as necessary.

### 1. Priority interventions in infrastructure for enhanced connectivity

In order to enhance connectivity between urban centers and priority development areas a number of strategic interventions need to be agreed upon and implemented, coordinating the different development programmes of ministries, municipalities and residents' priorities. At a strategic level, four different priorities are identified:

- » *Northwest Boulevard in Canaan North:* In order to connect Cabaret with Croix-des-Bouquets and Thomazeau there is currently only one main route along RN3 and RN1 that connects the western part and eastern part of northern Port-au-Prince. According to the expected urban and industrial growth, the area needs to plan in advance accordingly and enhance connectivity of the area by providing alternative routes for the different people and good flows that will exist. For these reason, and given the expected transformation of Canaan North into an urban consolidated area, a central axe would be required to connect Titanyen and Onaville, providing an alternative route to the national roads. This route should be preferably used for residents and light traffic, diverting good traffic through the RN1 and RN3.
- » *Service lane along the RN1 and RN3 from Titanyen to Onaville:* Connection of areas north of the RN1 and RN3 will be required in a near future to properly connect the area with the rest of the metropolitan area. As a growing traffic of motorized vehicles is expected, land provisions need to be made in order to facilitate the construction of service lanes parallel to the RN1 and RN3, which will ensure proper connectivity between Canaan North and the national roads in specific points without compromising traffic and creating congestion in the main road infrastructure.
- » *Coastal road from Philadelphia towards Archahaie:* As the metropolitan area of Port-au-Prince will continue extending towards the north along the coast line, the development of the Aubry and Archahaie areas will consolidate. With an increased number of residents and productive uses in the area, an alternative connection would be required.
- » Apart from the necessary development of public transport systems that reduce car dependency long term, the construction of this new infrastructure would allow diverting traffic from the national roads in order to promote a priority touristic zone.
- » *Connection from Onaville to Croix-des-Bouquets.*

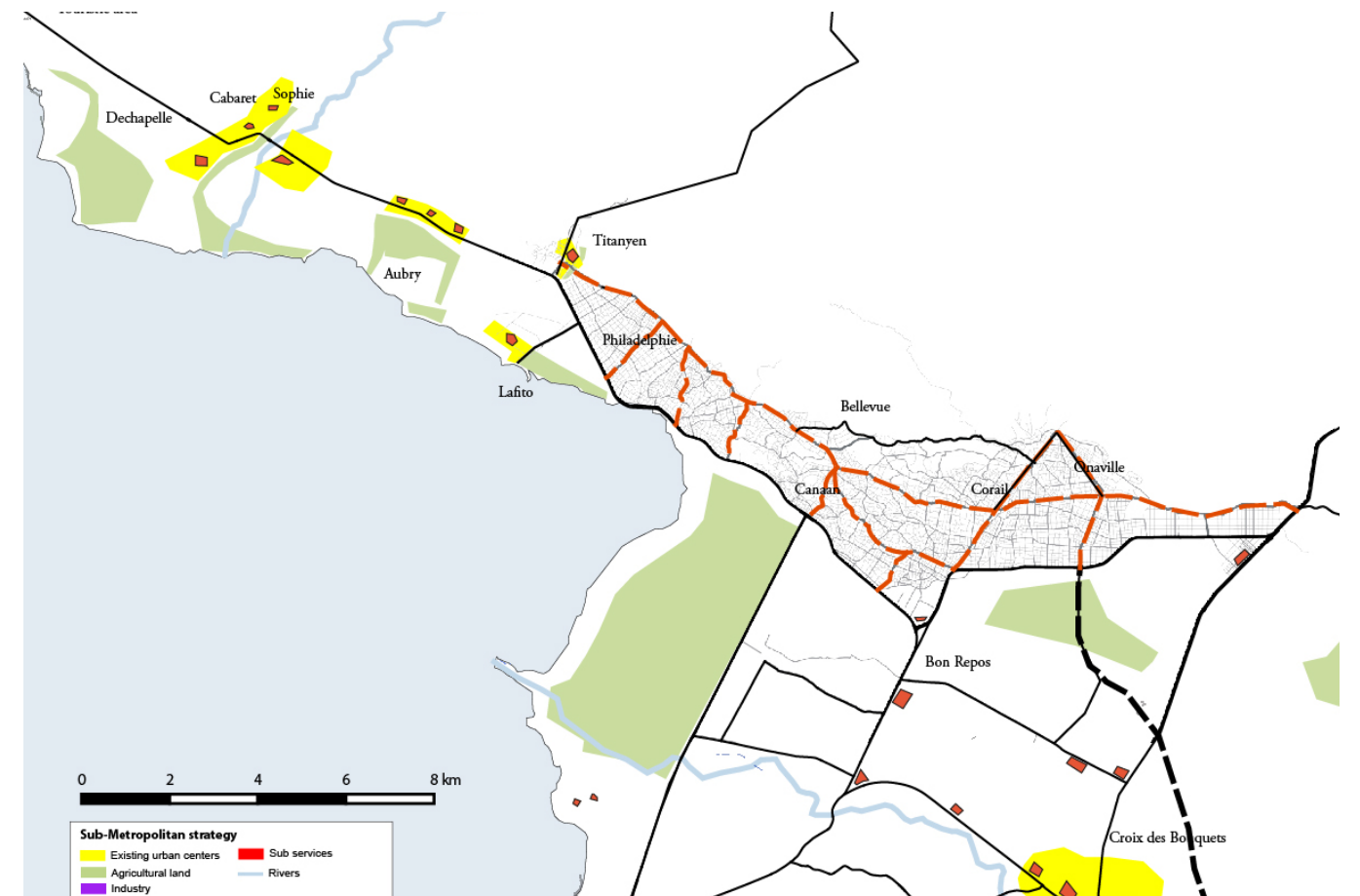


Fig.20: Existing roads and city fabric enhanced to improve connectivity. © UN-Habitat

## 2. Identification, promotion and creation of municipalities

The northern area of Port-au-Prince is formed by different communes belonging around the districts of Archahaie, Croix-des-Bouquets and Port-au-Prince. Inside these communes, there are existing main centralities that concentrate economic activities and residential areas. These urban areas, amongst which Cabaret, Aubry, Lafito, Titanyen stand out according to number of residents, economic activities and financial – human resources, constitute the main motors of the northern area of Port-au-Prince.

Current urban dynamics force most of the residents of the area to access services with a relatively low degree of specialization inside the commune of the Port-au-Prince district. There is a need to bring more services and jobs to the districts of Archahaie and Croix-de-Bouquets to counterweight the influence of Port-au-Prince district, consolidating a polycentric model of metropolitan growth that would bring important economic and social benefits while avoiding the negative externalities of a monocentric model with a whole metropolitan area depending on only one centrality.

Specifically in the area north of Canaan, unplanned growth has created an urban structure where centers are inexistent, not clearly defined or in some cases even duplicated. In order to promote a functional system of centralities, these centers which in some cases have consolidated informally due to the agglomeration of activities, need to be identified, promoted and consolidated together with municipal representatives, communities and residents, to articulate them as anchor points for economic and social development. Ensuring that these centers are properly defined and agreed upon would facilitate the concentration of public and private investments, fostering the emergence of economic activities and services for the population.

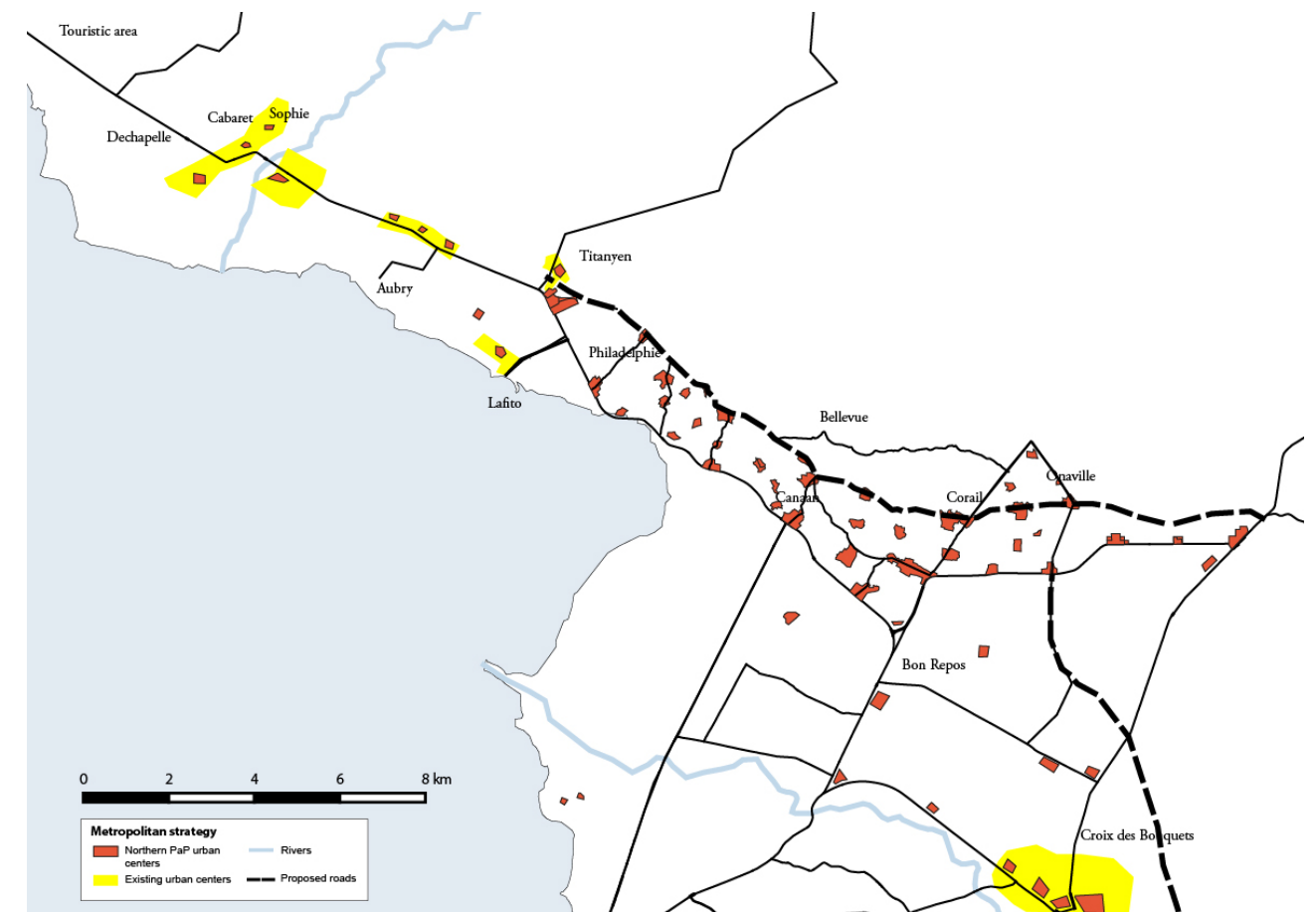


Fig.21: Definition of main urban areas that configure the system of centralities. © UN-Habitat

### 3. Location and promotion of economic activities in priority development areas

Further to the identification, promotion and consolidation of urban centralities, the northern area of Port-au-Prince, in order to develop according to sustainable principles, should provide a good balance of complementary land uses. Residential, commercial, light industrial and office uses would be mainly concentrated in urban centers. Nevertheless, productive uses, logistics, transformation activities and heavy industry would benefit from close access to transport infrastructure and concentration of complementary activities. For these purpose, the definition of priority development areas would contribute to the conformation and consolidation of areas with a certain degree of specialization. In the northern area of Port-au-Prince, there are currently a number of activities that could trigger the specialization process.

Lafite port: Eventhough conceived as a secondary port, the construction of the new port represents an opportunity to increase the efficiency and competitiveness of logistic and freight services in Haiti. Current costs linked to transportation and freight hinder the development of industrial goods, which represent a huge opportunity to the country, given the proximity of large markets such as the United States. Apart from hard infrastructure, the capacitation of local human resources to foster the competitiveness of operations related to logistics represent a critical area of development.

Agricultural production and agribusiness transformation hub: The northern area of Port-au-Prince contains a large percentage of land allocated to agricultural production while goods come from the north to RN1 and RN3. Ensuring the preservation of this land for the primary sector should be a priority for the strategic development of the area. This preservation should also be link to an investment in research and technology to enhance the productivity of the agricultural business, transitioning from the current low-productive small scale farming to a commercial agribusiness sector.

Linked to the enhancement of agricultural production, the creation of a hub for transformation and processing of agricultural products in the area would benefit from the proximity of Port-au-Prince, the access to road and port infrastructure and its location at the crossroad that connects with northern part of the island, where much of the agricultural production takes place.

Light manufacture and production of construction materials: The sector of light manufacture employed in 2016 around 30,000 workers, and it is expected to increase in the upcoming years. Rapid urban growth also represents a big opportunity for the production of construction materials, which are required both for civil works and edification. Given the proximity of the port, road connectivity and existing industrial area, the northern area of Port-au-Prince could further accommodate productive activities providing them with clear competitive advantages. Furthermore, due to the population growth that the area is experiencing, easy access to human resources increases the chances of the area to become a prime location for productive activities if capacity development programmes are put into place.

Logistic hub: The privileged location of the northern area of Port-au-Prince represents an opportunity for the development of a logistic hub to supply goods and services for the metropolitan area of Port-au-Prince as well as to be a center to consolidate production of agribusiness and light manufacture products for domestic and international markets.

Priority touristic zone: Proximity of the coast and scenic coastal landscapes provide also a clear opportunity for the development of activities linked to hospitality. Existing hotels towards Archaie would also benefit from the proposed agglomeration of activities as operational costs would drop and access to services and workforce would increase. The declaration of the northern area of Port-au-Prince as a priority touristic zone would support the middle-term transformation of the area, which could consolidate as a destination for the increasing number of international tourists but also for residents of Port-au-Prince. This development strategy envisions the creation of alternative infrastructure to access the priority touristic zone, in order to enhance connectivity with the port and the city center.



#### 4. Densification along main corridors and existing urban structure

With a clearly defined system of urban centers in place, inter-connectivity would be enhanced, both by creating and improving road and street infrastructure and also by defining a financially feasible public transport system that would take advantage of the operating principles of supply and demand. This enhancement of the connectivity would also include the definition of main and secondary transportation hubs where the swift from individual-collective to mass transit would take place. Once the main corridors linking urban centers is in place, densification would happen to a certain degree spontaneously, due to the advantages of living next to upgraded infrastructure and transportation hubs. Nevertheless, as the price of land in these centralities would raise substantially, policies, tool, incentives and guidelines to promote densification and avoid land speculation would need to be put into place at an early stage.

Public transport and urban services require a threshold of density over which they are financially viable and able to operate providing both quality and reliability. In this sense, 15,000 inhabitants per km<sup>2</sup> is the minimum recommended density for the provision of urban services. Although higher densities could be achieved in specific centralities of the northern area of Port-au-Prince, this threshold would be the guiding principle to develop areas along main corridors and close to transportation hubs.

Densification of existing urban structure apart from the projected density increase along main corridors and in urban center, densification of existing areas of the urban fabric should complement the actions taken in new development areas. Urban intensification of density and activities inside the Port-au-Prince conurbation is another complementary strategy to ensure that the amount of urban land required for urbanization is minimized, in order to control sprawl and preserve agricultural and environmental land uses. Specific areas inside Port-au-Prince and Croix-des-Bouquets districts have been identified as priorities for this densification to take place.

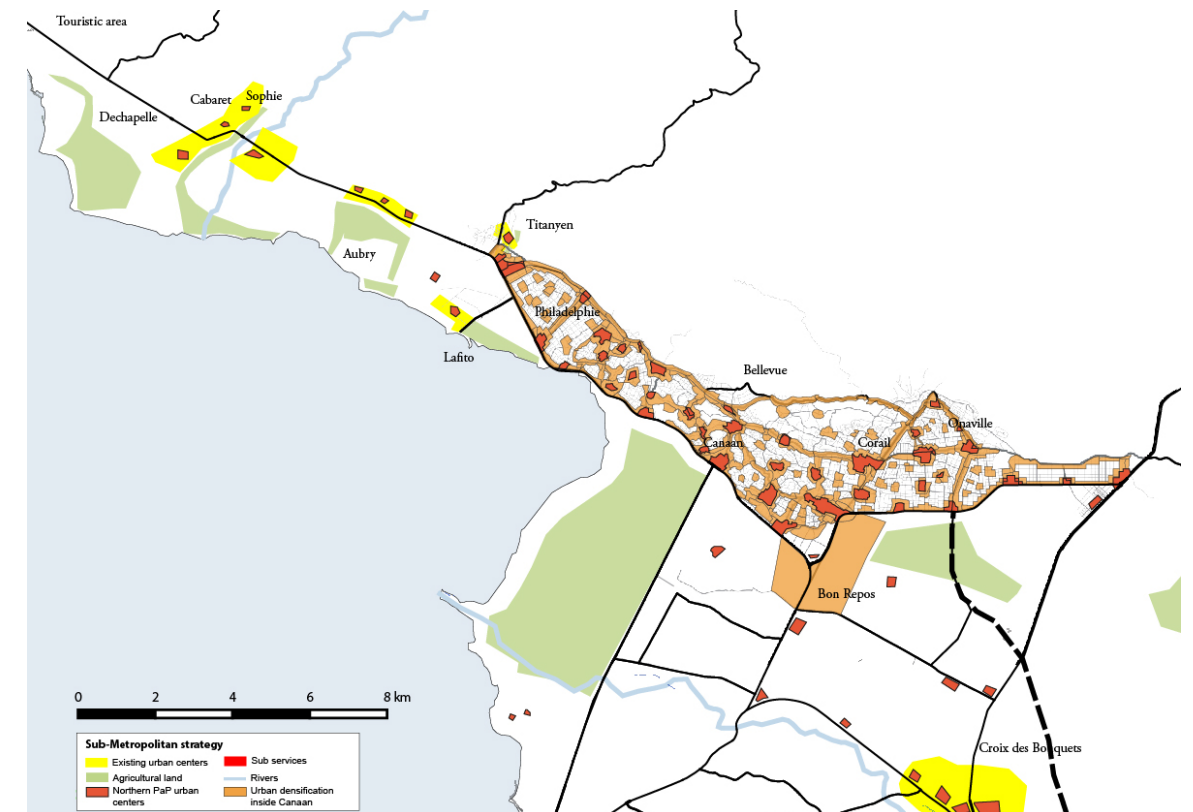


Fig.22: Densification and intensification of uses along main corridors. © UN-Habitat

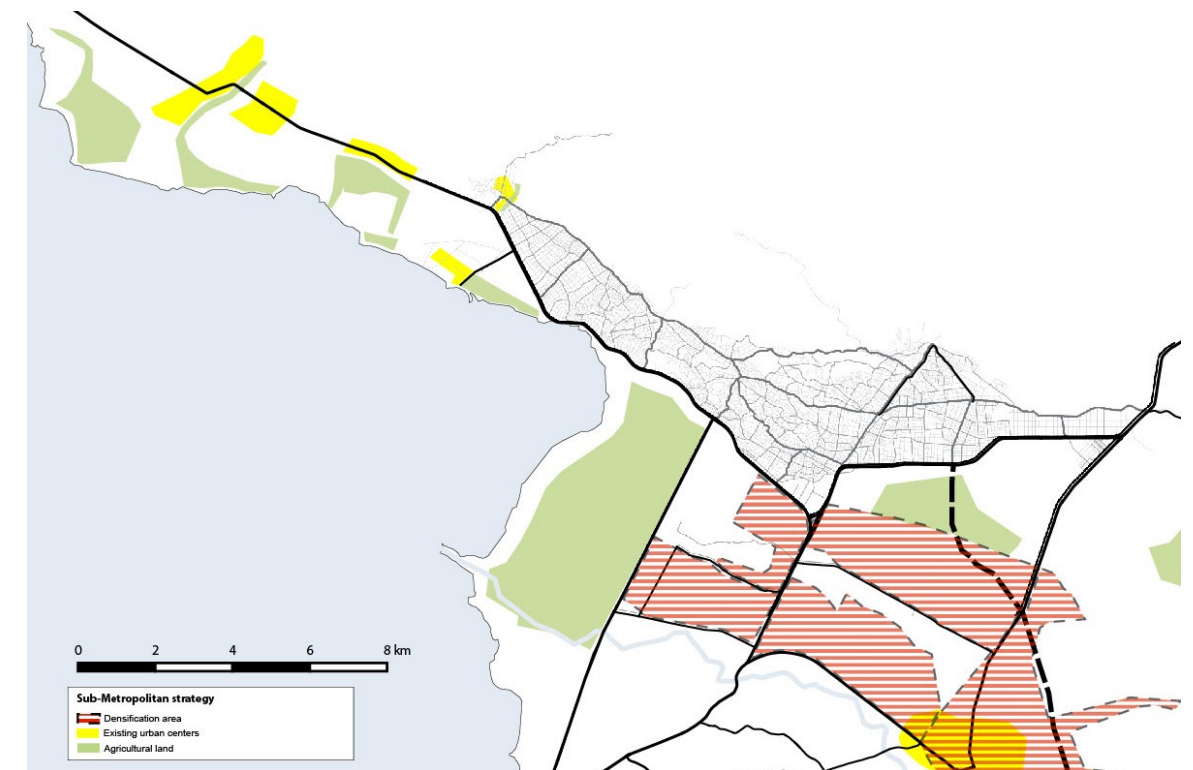


Fig.23: Infill development and densification of existing urban pattern. © UN-Habitat

### 5. Limitation and control of the urban expansion

The metropolitan area of Port-au-Prince, as previously analyzed, is extending along four main directions. Of these, the one with the highest potentials and lower negative externalities is the one located north-west from the metropolitan area, comprising the districts of Archie and Croix-des-Bouquets. Suitability of land is higher in this area than in the rest of the metropolitan area, due to its relatively flat topography, defined watersheds are reduced impact of erosion.

Uncontrolled and unplanned growth is happening throughout the Port-au-Prince metropolitan area in high risk areas located in steep hills and ridges. This is not an exception in the northern area of metropolitan Port-au-Prince, where new settlers coming in most cases from the communes inside Port-au-Prince district, are relocating in areas of low accessibility where they pose a high environmental risk. This is contributing to a density reduction inside the urban core due mostly to the more affordable land and rent prices in the peripheral areas in most cases prone to flood and erosion risks.

In order to control and minimize expansion in areas of low accessibility and affected by floods and erosion, two main strategies should be operationalized and implemented.

» *Non-aedificandi areas and growth boundary:*

Definition of non-aedificandi areas and growth boundary in the urban structure and neighborhood plans, as a result of a participatory process where the main actors involved, ministries, municipalities and communities come together to agree upon and subscribe a binding legal document that allocates resources and responsibilities to control growth. At the same time, this legal document would define the institutional and operational mechanisms to refrain newcomers from settling in non-aedificandi areas and to adequately relocate and compensate land owners that already have built up their houses in this areas.

Strengthening rule of law through inter-municipal agreements and community engagement in the daily supervision of their neighborhoods would have the potential to progressively revert and stop these expansion dynamics.

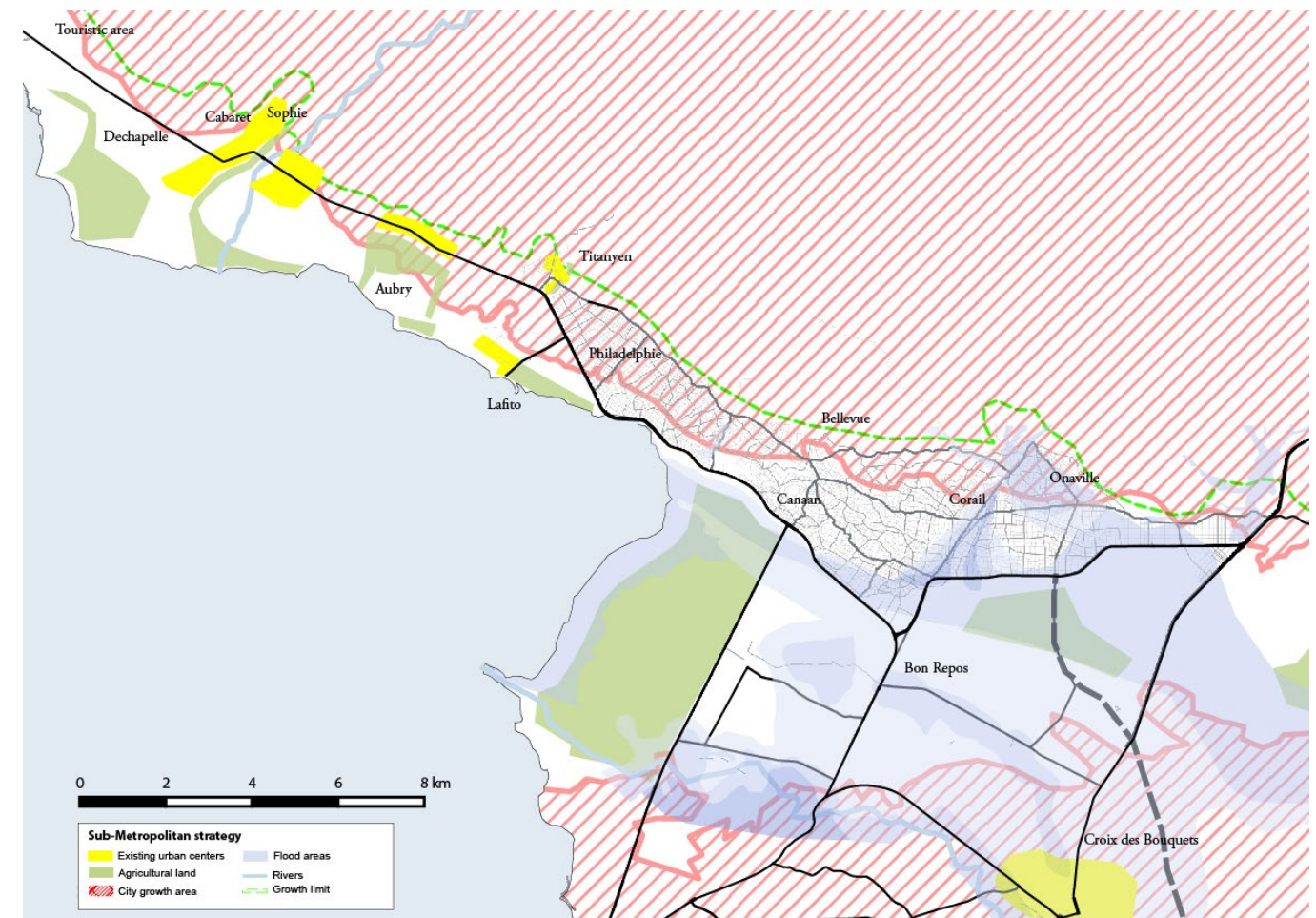


Fig.24: Definition of non-aedificandi areas and growth boundaries. © UN-Habitat



» Planning of extension areas

The definition of non-aedificandi areas and growth boundaries are powerful tools to control urban sprawl in non suitable areas. Nevertheless, given the current Haitian context where rapid population growth forces the transformation of rural into urban land to provide enough space for residential uses, limitation of urban growth will not succeed applied independently unless it is supported by provision of adequate urban land in other areas with higher suitability. According to the growth forecast for the metropolitan area of Port-au-Prince in which the urbanized area will double by 2030, suitable areas located in the districts of Arcahaie and Croix-des-Bouquets have been identified to initiate the discussion on how public-private partnerships could be a vehicle to promote planned developments that promote compactness, connectivity and social inclusion.

Another relevant achievement accomplished by promoting the allocation of suitable areas for planned city extension is that connectivity between the different areas of the city would be fostered, as transportation would not only rely on a road system but on a grid of avenues, boulevards and streets that would provide alternative routes to avoid traffic congestion. Planning in advance would imply having more control over the percentage and configuration of land allocated to roads and streets, which should be around 30% of the total area, land allocated to public spaces and other public services and facilities, which should be around 20% and remaining 50% which would be allocated to blocks and plots for mixed land uses, including commercial and residential. Planning in advance would also provide control over blocks and plots sizes, which would be another component to promote affordability of land. Different plot sizes would directly link to the possibility to provide different housing typologies for different income groups, fostering social inclusion inside the metropolitan area.

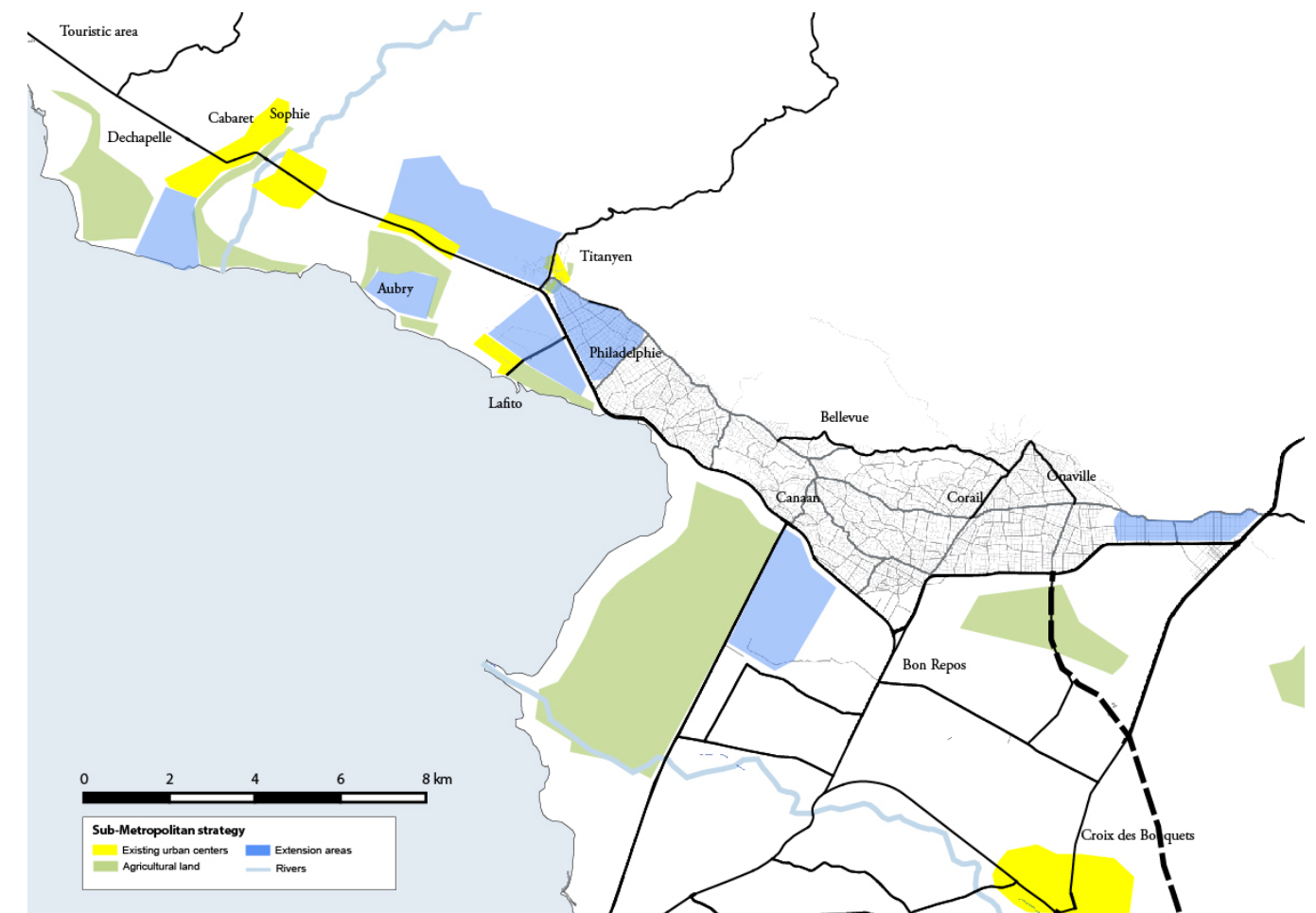


Fig.25: Planned extension of the northern area of Port-au-Prince. © UN-Habitat



## Urban Development Initiative (UrDI) for Canaan area of Port-Au-Prince

As urbanization and expansion of the metropolitan area of Port-au-Prince will inevitably continue due to population dynamics, planning extension areas in advance will not only create more compact, connected and socially inclusive areas, but also bring economic and financial benefits, fostering competitiveness of the urban areas and also allowing municipal administration to capture land value in a more efficient and consistent way.

Activities	Lead organizations	Potential Catalytic Projects	Recommended timing	Management note
<b>Objective 1: Coordination of actors as part of the urban vision</b>				
(1) Planning Charrettes	UCLBP, USAID and UN-Habitat	Charrette 1 Charrette 2	Ongoing process	
(2) Bilateral sessions	All stakeholders		Ongoing process	
(3) Technical advice	UN-Habitat		Ongoing process	
(4) Joint reviews	UN-Habitat		Ongoing process	
(5) Planning sessions with the "Tables de Quartier	American Red Cross and UN-Habitat	15 neighborhoods	Ongoing process	
(6) Public space design workshops	UN-Habitat and Block by Block	Bon Repos	Ongoing process	
<b>Objective 2: More compact, connected and socially inclusive northern area of Port-au-Prince</b>				
(1) Consolidation of urban centralities	MTPTC , UCLBP, American Red Cross, USAID and UN-Habitat	Bon Repos Canaan Onaville Philadelphia	Long term (+6 years)	
(2) Priority development areas	All stakeholders		Long term (+6 years)	
(3) Priority interventions in infrastructure	MTPTC , CIAT, UCLBP, USAID, Global Communities and UN-Habitat	Major east-west road; critical north-south linkages Route de Canaan	Catalytic projects should be implemented immediately; Additional services should be provided to match the pace of population growth	
(4) Densification along main corridors	MTPTC, CIAT, UCLBP, USAID and UN-Habitat	Route de Canaan N-W Boulevard	Long term (+6 years)	
(5) Densification of existing urban structure	MTPTC, CIAT, UCLBP, USAID and UN-Habitat		Long term (+6 years)	

Table 11. Implementation Strategies: Objectives, implementing partners, catalytic projects, timing and management

## FOOTNOTES

1. Singh, Raju Jan and Mary Barton-Dock. 2015. Haiti: Toward a New Narrative. Systematic Country Diagnostic. Washington, DC: World Bank
2. Edward Leman developed in 2001 a metropolitan model for a polycentric structure that has been later on adapted by Pedro Ortiz
3. Decree of June 1stth, 2005 Art. 9 states that new highways must be at least 13 meters wide.
4. Decree of Jan 6th, 1982 Art. 31 states that the maximum slope of new highways cannot exceed five percent to the main street, eight percent for all local roads and twelve percent for all collector lanes.
5. Decree of Jan 6th, 1982 Art. 35 states that intersections must have a sixty-meter field of visibility at each street that is connected to the intersection.
6. Decree of Jan 6th, 1982 Art. 34 states that a roundabout that ends in a dead end street must be connected to an existing nearby street by a pedestrian sidewalk that is at least three meters wide.
7. Decree of Jan 6th, 1982 Art. 33 states that any road that ends in a dead end street must include a roundabout that is at least 13 meters wide and not to exceed 50 meters wide.
8. Law of May 29th, 1963 Art. 14.
9. See Article 36-1, alinéa 2 de la Constitution de 1987 et non amendé; Haiti Property Law Working Group, A-How-To-Guide for the Legal Sale of Property in Haiti
10. Doc. FAOLEX n° LEX-FAOC088925
11. <http://faolex.fao.org/docs/pdf/hai41552.pdf>.
12. An implementation of a plan will most likely be under the tutelage of Interministerial Committee for Territorial Planning(-CIAT). CIAT was created by the Prime Minister in 2009 to help facilitate the coordination between ministries that have domain over issues of urban development, planning policy, protection and management of watersheds and land tenure.
13. The problems caused by Haiti's lack of a proper cadaster system have been extensively documented and analyzed. A fundamental issue with the system is its lack of proper record keeping. Without a functioning and updated database of property ownership, not only it is difficult to transfer property, this dearth makes it virtually impossible to resolve land ownership disputes.
14. Mediation is a method of nonbinding dispute resolution involving a neutral third party who tries to help the disputing parties reach a mutually agreeable solution. Arbitration is a dispute-resolution process in which the disputing parties choose one or more neutral third parties to make a final and binding decision resolving the dispute. The parties to the dispute may choose a third party directly by mutual agreement, or indirectly, such as by agreeing to have an arbitration organization select the third party. Black's Law Dictionnary (10th ed. 2014).
15. Development fees are contribution to the global infrastructure in adequation with the expansion of the area. That contribution can be in kind or in cash.
16. Participatory and Inclusive Land Readjustment, 2011
17. Social Tenure Domain Model (STDM) Piloting in Kenya, 25th Session of the Governing Council, April 2015
18. Piloting the STDM in Uganda, Danilo Antonio, UN-Habitat, 2014
19. Leader, K. (2014). Rapport de Stage Professionnel: Étude préliminaire sur la zone de Canaan & Jérusalem. Port-au-Prince: Ministère de la Planification et de la Coopération Externe.
20. Mercy Corps. (2016). Survey of Entrepreneurs in Canaan. Port-au-Prince: Mercy Corps.
21. Anderson, J. (2012). "An unlikely energy development opportunity emerges in Haiti." Breaking Energy. <http://breakingenergy.com/2012/05/30/an-unlikely-energy-development-opportunity-emerges-in-haiti/>
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23. Report available here: <http://www.worldwatch.org/system/files/Haiti-Roadmap-English.pdf>
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25. Ibid

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