

**POOR, URBAN PLANNING AND ADAPTATION TO CLIMATE
CHANGE: TALES OF HAITIAN CITIES**

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Summary:

This paper addresses how long term and sustainable urban planning strategies can be used in a context of extreme vulnerability (physical, social, capacity and institutional) to mitigate climate change and natural disaster risks. The adaptive capacities of Haitians to disasters is compared with those of other regions is reviewed. The fundamental contention of this paper is that urban planning plays a key role in strengthening adaptative capacities. The paper proposes a two-tract strategy: (1) mainstreaming climate change considerations in urban planning strategies while taking into account the political and social instability as well as environmental distress, and (2) increasing national and international investment in long-term and sustainable measures. The paper underscores that *climate change responsive urban planning* will be adding value to ongoing efforts to address fundamental social, economic, economic and institutional challenges facing urban dwellers in Port-au-Prince.

Key Words: Urban planning, governance, slums, environment, adaptation, vulnerability, Port-au-Prince, Haiti

"Last year's natural disasters took a great toll, but Haiti's government and people have the determination and ability to build back better, not just to repair the damage done but to lay the foundations for the long-term sustainable development that has eluded them for so long"

Former US President Bill Clinton in his statement accepting the position as UN envoy to Haiti on 19 May 2009.

Community facing the constant climate change treats in Port-au-Prince

'Martissant is a community ward under the municipality of Port-au-Prince, situated in the southern part of the city. It hosts more than 200.000 inhabitants and is growing steadily. As Martissant is bordered on one side by the sea and on the other side by a mountain, the Morne l'Hôpital, newly arrived migrants have to establish themselves on the edges towards either of these locations, which is unsafe and risky.

The informal settlements facing the sea are located on ground that is at or even below sea level. At the smallest rainfall the ground is flooded, as all water from the surrounding hills has to pass the area to reach the sea, and the drainage and channels are either not large enough or filled up with garbage or soil. The settlements also get flooded whenever the sea rises, which happens when there are strong winds. As if the flooding was not enough, the people in this area are surrounded by solid and liquid waste, disposed by themselves and by inhabitants living up the hills. When there is an inundation, the sanitary situation deteriorates further. In parts of the seaside settlements, the ground itself is composed of garbage that has been piled up. This is precarious when it comes to construction, as the foundations being built are rarely stable on the garbage ground and risks falling or floating away during times of bad weather

Up the hills the perils are not the same but equally dangerous. Houses are constructed on steep slopes, closely together and with no access roads other than small narrow paths or steps stamped out in the soil. Landslides happen often, and their occurrences are accelerated by the deforestation that has taken place over the years. If one house slides down, the risk is that it takes other constructions with it, creating a domino effect on the hillside and down into the gully.'

From UN-HABITAT (2009) *Citywide planning in Port-au-Prince: a situation analysis*, p.44

POOR, URBAN PLANNING AND ADAPTATION TO CLIMATE CHANGE: TALES OF HAITIAN CITIES

I. INTRODUCTION

Often, climate change debates focus on data projections, potential risks and environmental implications. This paper argues that, in the context of rapid urbanization of cities in developing countries, greater attention needs to be paid to urban planning as one of the means to reduce, mitigate and adapt to climate change risks.

Haiti is the poorest country in the western hemisphere. Haiti is also the smallest island the most vulnerable to natural disasters, particularly tropical cyclones and hurricanes. For instance, when it comes to tropical cyclones, everything considered to be the same, a UNDP (2004) report had found that Haiti is the most vulnerable, compared to Cuba or Mauritius. Haiti has one of the lowest emissions per head (Marland *et al.*, 2007), has signed the Kyoto protocol but is the one of the most vulnerable countries to climate changes impacts mainly because of its lowest adaptation capacity. This paper argues that good (urban) planning, even in the context of vulnerable and poor countries such as Haiti, can have a very positive impact on reducing the impact of disasters and assist growing number of urban dwellers coping with, and mitigate the negative impacts of climate related risks and changes.

In so doing, the paper reviews the adaptation potential and capacity in Haiti and Port-au-Prince. Comparisons are then made with similar countries and cities facing the similar climate change related challenges and manifestations. The levels of response, impact and damage are then discussed in the context of Haiti. The role of urban planning in the context of climate change is also examined in various countries and cities in the region to compare with Haiti and Port-au-Prince. The paper clearly shows that at the same level of exposure with other countries in the region, Haitian cities and city dwellers suffer the most.

This paper adopts the definition of vulnerability that considers the characteristics of an entity (person, group, organization, city or region) in terms of its capacity to anticipate, cope with, resist and recover from the impact of a hazard (Blaikie *et al.*, 1994; Sietchiping, 2006). To assist in assessing the capacity to respond to climate change in Port-au-Prince, Haiti, the following criteria are often referred to: physical planning (places, structures); knowledge and cognitive (awareness); and institutional and governance (e.g. planning systems, rule of law and enforcement).

The paper demonstrates that adaptation is clearly linked to capacity to respond and level of preparedness, which urban planning has a clear role to play. The paper underscores that the adaptive capacity of city dwellers is a factor of environmental conditions, economic ability, technological response and institutional governance including urban planning. The assessment of cities in Haiti shows that they fall short in all these components, particularly on implementation of sound urban planning approaches.

In reviewing the urban planning readiness of the city of Port-au-Prince to respond adequately to climate challenges, the paper notes that urban dwellers are the growing majority, often slum

dwellers, who settle in high risk areas. Urban planning and zoning regulations that could hinder this type of development are rare and do not cover the metropolitan area as a whole. More importantly, implementation planning and building regulations, often ill-adapted and outdated, are practically non-existent. It is clear then that current planning practices or the lack of it, instead of reducing exposure and vulnerability to climate change, climate change manifestations are increasing the threat faced by the growing number urban dwellers in Haiti who are settling in hazardous and risks-prone areas.

The paper illustrates that in the context of poverty, weak economy performance and poor governance it is less likely to adopt sustainable technologies. Yet, failure to embrace green technologies and sustainable behavior, which often may have low environmental impacts, further weakens the capacity to adapt to climate change impacts and manifestations. Some of the implications are that when the poorest people are struggling for survival, depending on sporadic handouts, they are more vulnerable to climate consequences. Adaptation, rather than mitigation becomes a priority. The paper, therefore suggests that unless a strong, urgent and long-term development program (of which urban planning is a key priority) and disaster reductions strategies are implemented, urban dwellers in Haiti are caught in the vicious circle of victims of climate change impacts and foreign dependency. The paper recognizes that the success of the implementation is dependent upon key basic factors such as political will and stability, substantive international support, social and economic stability and good governance. The paper draws a range of policy implications including the wider international support to build resilience and adaptation of individuals and communities.

II. CLIMATE CHANGE AND CITIES IN HAITI

It is clear that the topography makes most of built environment in the Port-au-Prince metropolitan largely unsuitable for human settlements. It is estimated that 85% of Port-au-Prince residents live in informal settlements, which is often associated with hazard-prone areas, unsuitable, for human settlement (UN-HABITAT, 2009). Effective urban planning in Haiti requires unblocking the implementation deadlock and fostering community participation. Ranking 180 out of 206 countries, Haiti is one of the lowest emitter of CO₂ in the world (Marland *et al.*, 2007). Haiti is also the least emitter in Southern and Central America. Yet, Haiti is the most vulnerable and less able to cope with natural disasters including those that are climate-induced.

With an estimated 310 inhabitants per square kilometer, Haiti (estimated nine million inhabitants) is the most densely populated country in Latin America (UN-HABITAT, 2009). The poverty gap¹ in Haiti is 28%, the highest poverty gap² in the region (World Bank, 2006). Haiti is both the least urbanized (40%) country in the Caribbean region, but is the most rapidly urbanizing (8%) country. Haiti is known as the poorest country in the western hemisphere and

¹ Poverty gap is the mean shortfall of the total population from the poverty line (counting the non-poor as having zero shortfall), expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence.

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ranks amongst the Least Developed Countries (LDCs). Haitian economy has been in decline since the 1960s and the country's GDP had subsequently been negative or no growth (World Bank, 2006). According to the World Bank's Governance Indicators³ governance in Haiti has continued to decline. Haiti is ranked among the bottom five out of 212 countries. The 2008 Transparency International⁴ ranking has Haiti 177th out of 180 countries.

The 2007 United Nations Development Programme (UNDP) reported that in 2004, the Dominican Republic and Haiti were simultaneously struck by Hurricane Jeanne. In the Dominican Republic, some 2 million people were affected and a major town was almost destroyed, but there were just 23 deaths and recovery was relatively swift. In Haiti, over 2,000 people were killed in the town of Gonaïves alone. The toll was higher in Haiti because of the extent of poverty and environmental destruction has denuded hillsides of trees and left millions of people in vulnerable slums. Further, governance problems, low levels of finance and a limited disaster response capacity left public agencies unable to initiate rescue and recovery operations on the scale required. In the Dominican Republic, national laws have limited deforestation and the civil defense force has a staff 10 times larger than its counterpart in Haiti to cater for a population of similar size (UNDP, 2007 pp.182-183).

Situated in the Caribbean, Haiti shares the Island of Hispaniola with the Dominican Republic. The geographic location of Haiti places the country directly on the path of hurricanes. The location of the island, the severely degraded landscapes, increase the manifestations of climate change and ineffective risk management strategies compound to Haiti's regular exposure and vulnerability to tropical storms, landslides and flooding, cyclones and hurricanes. According to the Emergency event database (<http://www.emdat.be/Database/terms.html>), for the last 100 years, tropical cyclones and floods (mostly flash floods, urban floods, sewer floods) are the common natural disaster in Haiti. Tropical cyclone had killed more than 14,000 people and affected an additional 3.2 millions.

Haiti regularly witnesses various climate change related events such as gales, torrents, heatwaves, droughts or heavy downpours. Above all, these changing weather regimes lead to unnecessary human and property losses, particularly in densely populated areas in cities and towns. Loss of property and human life could be prevented and spare.

For several decades, Haiti is engulfed in an annual cycle of losses during and after the hurricane seasons. For instance, 2004 floods and hurricanes killed more than 4,000 people and left 20,000 homeless in Haiti (UN-HABITAT, 2009). These are not isolated incidents as other weather-related events are taking their toll on the city as a whole. Haitian cities such as Port-au-Prince and Gonaïves are failing to cope and deal with climate change manifestations. In the space of a month in 2008, Hurricanes Gustav and Ike and tropical storms Hanna and Fay killed more than 1000 people in Haiti. More than 600 people perished in Gonaïves, the hardest hit city, which was

³ World Bank's Governance Indicators, which measure voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and corruption http://info.worldbank.org/governance/wgi2007/sc_country.asp

⁴ Transparency International's Corruption Perception Index for 2008, http://www.transparency.org/news_room/in_focus/2008/cpi2008/cpi_2008_table

also heavily devastated. The United Nations Envoy⁵ in Haiti at that time estimated that these storms caused the Haiti's gross domestic product to fall by between 3-4%.

III. PORT-AU-PRINCE: A NATURAL DISASTER HUB

Port-au-Prince, the capital city of Haiti is situated in low-lying coastal area within the gulf of Gonaïve in the southern part of the country. With between 2.7 and 3 million inhabitants, Port-au-Prince metropolitan area hosts about 30% of the total population and accounts for 90% of formal employment and investment in the country (Government of Haiti, 2003). Other cities such Gonaïve, Cap-Haïtien and Jacmel are rather modest. More than 85% of urban dwellers in Port-au-Prince live in overcrowded slums informal settlements situated (UN-HABITAT, 2009). Slum dwellers are particularly at natural disaster risks because they often settle on relatively hazardous sites such as floodplains and hills, which are susceptible to floods, landslides and other climate-related disasters.

The urbanization trends in Port-au-Prince constitutes a challenge and an opportunity. Challenge to maintain and provide adequate infrastructure, employment, shelter and services for the growing population. These inadequacies are further compounded by the institutional and governance shortcoming, economic and local financial constraints and social and political instability, as well as the heavy drain of skilled workforce (World Bank, 2006). Cities such as Port-au-Prince do possess opportunities to manage disaster risks. For example, previous experiences natural disasters, concentration of people, strong presence of international development bodies including religious groups, bilateral and multilateral agencies.

As the population of Port-au-Prince has increased over the year, the surrounding mountains, up to 2000 meters, have been gradually humanized and cultivated. Poor land use management on the steep slopes of these mountains and hills have led to severe land and vegetation degradation as well as the destruction of natural drainage system. Land slides and frequent. River systems and courses have been gradually destroyed and diverted. Water from rain cannot longer filter through the water tables and thus create storm water and instability on built environment (building, roads and infrastructure) which regularly cost lives and properties. In the event of rain, slums in the plains (such as Martissant) are filled with debris, mud and storm water. Rains and hurricanes, whatever the magnitude, destroy property, building and other infrastructure, and create floods.

Administratively, Port-au-Prince metropolitan region covers eight municipalities: Carrefour, Cité Soleil, Croix-des-Bouquets, Delmas, Kenscoff, Pétion-Ville, Port-au-Prince and Tabarre. These municipalities are implementing several programs at local levels despite the lack of a clear regulatory framework, weak coordination mechanism, poor governance and limited resources. Severe drought in the countryside and the magnet of Port-au-Prince explain the rural-urban migration that largely contributed to the rapid urbanization of Port-au-Prince.

The spatial and population expansion of the capital city requires a citywide and metropolitan approach beyond the current administrative boundaries. The rapid urbanization or *bidonvillisation sauvage* takes essentially the form of slums in an impoverished environment

⁵ Mr Hedi Annabi was addressing the reporters after his visit in Haiti
<http://news.bbc.co.uk/2/hi/americas/7624850.stm>

in any vacant space and peri-urban areas of the city (UN-HABITAT, 2009). Considering that adaptation to climate and disaster risks is played at the local level, these local authorities will and should have a greater role and responsibility in implementing adaptation measures.

The urbanization of Port-au-Prince has been fast-tracked by the high incidence of natural disasters that further engulfed the population in the poverty trap.

Left unchecked, the rapid urbanization of Port-au-Prince will not only further weaken the adaptive capacity but also increase the vulnerability and exposure of the large number of Port-au-Prince urban dwellers to adverse effects of climate change. For that reason, effective urban planning is becoming a critical part of the climate change solution package, especially adaptation measures and reduction of further exposure to negative effects of climate change. In the context of Haiti, adaptation to climate change in urban settings has been rather weak. More importantly urban planning instruments and tools to address support climate change and natural disasters challenges have been regularly overlooked at local, national governments as well and international institutions (bilateral, multilateral and NGOs) operating in Haiti and in Port-au-Prince. Difficulties to handle and adapt to climate change risks can be observed in four areas: preparedness, response, recovery and adaptation.

IV. ADAPTING TO CLIMATE CHANGE CHALLENGES IN PORT-AU-PRINCE

In Port-au-Prince, disaster preparedness plans are not operational, especially in deprived areas such as slums and landslides-prone areas. UN-HABITAT (2009) noted that Port-au-Prince is poorly prepared to handle climate change and disaster risks and changing weather patterns. For instance, there is no enumeration of people and property in slum and other flooding and landslides-prone areas, where disasters often strike. Further, there is no mapping of disaster-prone areas and possible relocation areas in case of disaster. The evacuation plans and information on the same are not known from local communities.

Responses to disaster events such as flood, fires, and landslides is often poor due to poor spatial planning, lack of adequate equipments and services, financial resources, poor training and capacity to handle the often high magnitude of the event. More importantly, the very weak capacity of local and national governments to implement and enforce spatial and land use planning regulations and laws, albeit obsolete and inadequate, have contributed to the expansion of slums and settlements in hazard- prone areas such as drainage zones, flood plains, steep slopes, water ways, marshlands, dumpsites, etc.

Densely populated slums such as la Saline, Cité Soleil and Martissant have therefore been established in such hazard-prone areas. In the event of disasters, access to affected areas is always a challenge partly due to poor planning, poorly equipped services (e.g. fire services) and poor access roads. Rescue equipment is not always readily available and adequate to respond promptly and effectively. National and local resources to respond are often limited. Historically, failures to opt for long term and proactive measures often lead to further decline and jeopardize the adaptation measures (Diamond 2005). When disaster strikes poorest countries such as Haiti, international efforts are not always timely and focus on short-term rather than long-term support (UNDP, 2007). Given that disaster hits the poorest and vulnerable groups the hardest, particularly in the context where property and life insurances are non-existent, makes the long term recovery very challenging and bleak for the majority poor (Prasad *et al.*, 2009). Resources

are lacking for evacuation operations, which means more properties and human lives are lost aftermath or during the disaster. Some of the natural disaster losses could be saved by privileging long-term recovery through adequate planning.

The recovery and reconstruction phases also overwhelm local and national budgets and resources. Reliance on non-governmental organizations, religious institutions and international communities (both multilateral and bilateral) are often essential for the aftermath phase. However, the lack of coordination and the focus on short-term activities and projects, however, often limits the impacts. The lack of resources have made reconstruction work a daunting task, particularly when infrastructure and services destroyed are not always rebuilt to the stage prior to the disaster event. The incapacity and the unmet cost to make up to the losses due to natural disaster further increase the vulnerability and exposure to climate change and natural disaster risks of Port-au-Prince residents.

Haiti has missed several opportunities to learn lessons from past disasters, despite the frequency and similarities of natural disaster events. After a natural disaster, urban communities and the city of Port-au-Prince return to the 'routine', which for most is mainly struggling for survival. When the next unavoidable episodes of natural disasters occur, the city is less prepared than ever. Comparing Haiti to other small islands development States facing the similar situation, the country is far more exposed and vulnerable to disaster. For example, Cuba and Mauritius have considerably reduced their vulnerability to the similar proportion of people exposed to climate risks as Haiti, by investing early warning, disaster preparedness and evacuation. Over the years, Cuba, Dominican Republic and Mauritius have learnt lessons from previous events and built their capacity to respond, adapt and recover (UNDP, 2007). Haiti situation is further exacerbated by the level of poverty, poor governance, environmental degradation and the inefficient planning practices..

V. MAINSTREAMING CLIMATE CHANGE DIMENSION IN URBAN PLANNING INITIATIVES

In 2004, the Dominican Republic and Haiti were simultaneously struck by Hurricane Jeanne. In the Dominican Republic, some 2 million people were affected and a major town was almost destroyed, but there were just 23 deaths and recovery was relatively swift. In Haiti, over 2,000 people were killed in the town of Gonaives alone. Additional tens of thousands were left trapped in a downward spiral of poverty. The contrasting impacts were not the product of meteorology. In Haiti, a cycle of poverty and environmental destruction has denuded hillsides of trees and left millions of people in vulnerable slums. Governance problems, low levels of finance and a limited disaster response capacity left public agencies unable to initiate rescue and recovery operations on the scale required. Dominican Republic, national laws have limited deforestation and the civil defense force has a staff 10 times larger than its counterpart in Haiti to cater for a population of similar size (UNDP, 2007).

Though instruments might exist in some urban planning practices, some of the critical impediments are the poor capacity of local and national capacity to implement and enforce policies, laws and regulations, as well as enforce the rule of law (Prasad *et al.*, 2009). In Haiti for example, building codes need a considerable review to adapt to climate change challenges and mechanism developed to facilitate their implementation. For the last 50 years or so, the political

and social instabilities have impounded the establishment of a governance structure to service the need of the population and foster social and economic development. The instability has severely impacted on the implementation of any urban planning regulation.

It is worth noting that Port-au-Prince metropolitan region does not implement comprehensive master or land use plans or maps nor any other form of planning regulatory framework. In selected cases, local governments in Port-au-Prince attempt to by-laws largely for taxation purposes. Even for tax collection purpose, the process is selective and concerned a few households in what remain of the ‘formal’ built up areas in the pocket of planned neighborhoods such as Delmas. Yet and by large, population living in hazardous areas are the most affected and vulnerable to climate change risks. Effort to equip the metropolitan Port-au-Prince with enforceable planning instruments.

5.1 Physical planning and climate change

Physical planning is critical because it can contribute in preventing and managing the exposure risks of the majority of inhabitants living in slum areas located in hazard-prone landscapes (UN-HABITAT, 2009a). Poor urban planning in Port-au-Prince contributes to further exposing and making significant number of people vulnerable to climate associated risks. The landscape of the city is dominated by floodplains and hills with steep slopes. The city’s landscape would have warranted a strong planning scheme to avoid perpetual landslides and flooding. This is not the case. Enacting and implementing a physical planning in Port-au-Prince could have reduced exposure and vulnerability to climate change risks. In Port-au-Prince in general, buildings and structures are not hazard-proof and of poor quality or standard. Building permits and inspections are not common practice. Therefore, incidences of building collapsing due to poor standard are common⁶.

The cost of construction and maintenance of storm surge protection is clearly beyond Port-au-Prince local authorities. A key investment area that could save life and property in the largely impoverished urban settlements in Port-au-Prince is the investment in adequate drainage system. Bates *et al.*, 2008, p.68) noted that drainage and storm water management is important in low-income urban communities, as blocked drains can cause flooding and increased transmission of vector-borne diseases. Cities with combined sewer overflows can experience increased sewage contamination during flood events, thus contributing to health hazards (Parkinson and Butler, 2005).

Considering that flood and hurricanes are the most frequent natural disaster affecting Port-au-Prince, planning instruments may including guidance on managing flood risks. In particular, green or natural buffers zones may be created along the natural waterways and along coastal areas prone to flooding. Such measures may contribute in off-setting the negative impacts of rainfalls during storms and hurricanes. These planning interventions will need only political will

⁶ Between – and 12 November 2008, two schools (Grace Divine Primary and Secondary School as well as Petion-Ville school)) collapsed in Port-au-Prince killing two poor neighborhoods (Canapé Vert and Petion-Ville) killing almost 100 people. Poor-quality construction techniques and the location in foot ravine, steep slope, and heavy rain all contributed to the collapse of the school buildings and other surrounding houses (http://en.wikipedia.org/wiki/Category:Disasters_in_Haiti).

and capacity to implement, but also financial resources to relocate current residents and make better use of the land.

5.2 Urban planning and information management

Urban planning requires reliable data. Knowledge and information are essential for enhancing adaptation to natural disasters and climate change risks. The knowledge could take many forms including where and when what type of disaster will occur, what are the effective adaptation measures for any specific event. Inhabitants of hazard-prone areas have limited access to information to assist during the preparedness phase of an upcoming natural disaster. Access to emergency and rescue services are limited. Inadequate information on the number of people living in hazard-prone areas makes it difficult to mount effective rescue operation. It also difficult to evaluate the number of people affected and the damage cost. Storm-water drainage infrastructure is often inadequate to handle water, sewage and storm surge, especially during the hurricane seasons.

The capacity to assess and monitor natural risks is also low. Enumeration, inventory and participatory local planning are examples of low-cost and participatory techniques that can greatly assist communities and authorities gather and manage information for disaster prevention, management, recovery and reconstruction.

Since 1999, the central government, with support from development agencies in Haiti has created local participatory committees and organized training sessions for its members (GoH, 2003). Establishing local committees is an important initiative but which has a poor up-taking at local level. The limited involvement of local people is partly due to low level of awareness and ineffective coordination through a natural disaster crisis. Further, often disasters overwhelm the poorly equipped committee members who become unable to efficiently handle the crisis. The response is often uncoordinated and resources are stretched.

Port-au-Prince would greatly benefit from a comprehensive map of areas in Port-au-Prince under the threats of various climate change and natural hazards. Local knowledge of various evacuation plans as well as personal disaster management plans supported by effective disaster preparedness and communication strategies, would go a long way to safe life and properties in metropolitan Port-au-Prince. The evacuation plans are not effective and would benefit from neighboring countries' (e.g. Dominican Republic and Cuba) experiences should cooperation be established in such areas.

Security plays a critical role in implementing effective planning. For some decades, security, crime and safety have been of great concern in Port-au-Prince (UN-HABITAT, 2009). Such situation has undermined adaptation capability of the inhabitants. For example, despite growing threats of flooding and landslides for instance, residents are reluctant to leave their homes and properties behind for fear of looting and stealing. When the majority of population often decides to stay home to protect their belongings increase urban dwellers' vulnerability and exposure to climate change risks. The current United Nations Stabilization Mission in Haiti (MINUSTAH) has contributed to peace disaster operations in the country. The presence of this mission presents an opportunity to continue building local capacity and long-term investment in development programs and disaster adaptation ability.

Institutional capacity is another important element to consider for effective planning. For decades, political and social instabilities development programs have shaped interventions in Haiti. One of the implications is that development agencies have favored short-term, humanitarian, and project-driven activities. Long-term and preventative approaches such as urban planning have been a lower priority.

One of the most pressing institutional weaknesses is the lack of effective decentralization framework and operational local institutions that would support the implementation of risks management at district level. The main challenge for national and local authority in Haiti is the institutional capacity to design and implement policies and by-laws to promote architectural designs that are disaster responsive. Should the political will and climate be favorable, Port-au-Prince municipalities can tap into the range of vibrant and useful adaptive policy instruments and practical design measures. Some of these instruments include city by-laws (including building codes) can promote efficient, sustainable and low-cost building structures and materials, hazard resistant housing, alternative energy sources (solar, green roofs), recycled of rainwater and gray water. The main challenges would be the means of implementation.

There is a need to develop and implement a municipality or city level climate change action plans anchored in the broad framework of a city wide planning (UN-HABITAT, 2009). Often, however, Port-au-Prince municipalities (eight in total) have limited capacity to enforce existing regulations. Adequate resources are also lacking to effect local plans. This means improving adaptive capacity and reduce exposure and vulnerability to climate change related risk will be complemented by other measures such as improving governance (for instance effective decentralization and devolution, accountability and rule of law), empowerment of local communities, improvement of living conditions (through reduction of poverty incidence) and improve spatial planning. This goes to show that urban planning is part of the climate change mitigation and adaptation (UN-HABITAT, 2009a).

However, when a meaningful urban planning is not in place for Port-au-Prince, other planning instruments could be utilized to equip the city and at its inhabitants to disaster challenges. Even in the absence of statutory urban planning and development control systems, sensitive climate change by-laws on building standards and regulations can be enacted and implemented at local and preferably at the metropolitan level. The success of the implementation will partly depend on the strength and broad-based partnership and participation from various stakeholders including local and national governments, industry, non governmental organizations, religious groups, development partners and communities.

Appropriate climate-responsive technologies can also be promoted through research, technical cooperation and enabling economic and political environments. For instance, there are various technology solutions proposed to improve adaptation to climate change risks and reduce vulnerability to natural disasters facing Port-au-Prince residents. Some of these solutions include building techniques and construction, energy efficient housing, storm surge barrages, flood management technologies (e.g. diversion structures, dike management and construction of spills ways drainage techniques), water harvesting and treatment hazard resistant housing, local material, early warning systems, mapping solutions, etc.

VI. POLICY IMPLICATIONS

There are several considerations, opportunities and challenges to strengthen the capacity of Port-au-Prince and its inhabitants to adapt to climate change manifestations. Adapting to climate and disaster risks will benefit of Haiti as a whole in its quest to put the country back on the development track. Lessons learnt from past experiences clearly show that preventative and long-term urban development should be encouraged along short-term and reactive interventions. There are a range of policy orientations that could contribute in that endeavor.

First, national government and international communities in Haiti can build the capacity of local communities and cities' governments to understand, cope with and adapt to climate related risks. Even in the context of unclear regulatory frameworks, local authorities and communities can significantly reduce their vulnerability and exposure. For instance, knowledge and information on disaster risks, responses and adaptation measures will be very useful. This is particularly important for the implementation of urban planning activities. To be effective, there is a need to coordinate national and international efforts related to disaster management, especially in urban settings.

Second, there is an urgent need to strengthen the implementation and enforcement capacity of local and national governments to clearly undermine adaptation capacity. Importantly, urban planning cannot be divorced from good governance particularly the decentralization efforts and the rule of law. Haiti needs to develop and implement climate change and disaster responsive urban planning instruments and regulatory frameworks. This will mean shifting towards progressive and preventive policy approaches that would encourage long-term interventions with maximum gain over time.

Third, there are practical planning measures that do not have to wait for comprehensive urban policies and frameworks. Such measures include outdoor protection against wind from sea tide, by-laws building code that promotes and enforces hazard-proof material, protecting building against winds and storm surge, energy efficiency in building construction and household use, escape spaces in buildings (e.g. on roof-top). Promoting disaster-resistant urban transport infrastructure will also be an effective means to reinforce adaptation capacity.

Fourth, strengthening urban dwellers' information and knowledge of disaster and climate risks and management are critical. For example, knowledge of all possible multi-hazards and their means of mitigating and adapting is a cheaper way to save life and property. In the case of Port-au-Prince, these hazards include hurricane, flooding, landslides. It is critical to map all hazard-prone areas and develop an effective information and communication strategies for managing those risks, including disaster preparedness strategies.

Fifth, Effective adaptation to climate risks requires a multi- and cross-sectoral approach. That is, sectoral policies have to fully account for the ongoing impacts of climate change in Haitian cities. These policies have to address challenges such as rapid urbanization, poverty, and poor governance. In that respect, urban and land use planning could be an effective instrument to reduce vulnerability to climate change related manifestations such as floods, cyclones and landslides. It is clear that urban planning has a role to play to mitigate the impact of climate change and facilitate the adaptation to climate changes in cities. Mainstreaming climate change in urban planning becomes a necessity. Urban planning's role should be conducted in tandem with other strategies regarding, for instance, energy efficiency, land use, transport, shelter and

building materials, urban governance, disaster risks management, funding, of course with particular attention paid to vulnerable groups such as slum dwellers, young, and women.

Sixth, addressing climate change challenges requires an ‘urgent need to increase funding for climate change science in the poorest countries to help those countries understand how to adapt to climate changes already under way and changes that are likely to occur in the years ahead’ (Sachs, 2008, p.106). Paying particular attention to vulnerable urban communities, groups and countries is critical, not only because their adaptive capacity seems to be lower (Sietchiping, 2006), but also because they suffer drastically from consequences of actions which they barely created. There is clearly a moral responsibility for the international community, especially the developed nations to support poorest nations.

Seventh, the other important dimension is the cost of adapting climate change technologies. Several climate change technologies currently on offer are beyond the financial and human capacity of developing countries and small islands states such as Haiti. Climate change responsive urban planning technologies targeting building material, construction techniques, energy, infrastructure (storm or cyclone-proof urban infrastructure), etc. are beyond the reach and financial capability of urban and local authorities in Port-au-Prince. Making such energy affordable, accessible and adapted to poorest countries’ conditions, through for instance knowledge exchange, research and funding, will go a long way to reduce the disaster impacts and the cost of post ante operations such as rescue, recovery and reconstruction. The point here is on long-term investment with ‘high’ returns and ‘upstream’ savings. It is clear that national and international urban development strategies in poorest countries such as Haiti, should mainstream sustainable and long-term disaster strategies in their interventions. Piecemeal and short-term operations can only further undermine urban dwellers and local government capacity to handle ongoing climate change manifestations.

Finally, a mix of autonomous adaptation (which are individual urban dwellers’ responses to offset negative impacts and take advantage of positive one) should be supported by planned adaptation, which may require changes in policies, institutions and dedicated infrastructure, to secure sustainable benefits of adaptation responses to climate change.

VII. CONCLUDING REMARKS

The paper underscored that in the context of severe poverty and constant instability, long term and preventative strategies such as urban planning are of less priority for local and national governments as well and international development agencies. In particular, the paper analyzed the role of urban planning or lack of it, as well as options for strengthening adaptation capability of the capital city of Haiti and its inhabitants. While the challenges facing urban dwellers in Haiti appear overwhelming in terms of implementing effective and long –term strategies, urban planning appear as a quick and sustainable instrument that can be promoted. This paper also looked at the adaptation capability to natural disaster and climate change in the context of poverty, social instability, weak governance and environmental distress of Port-au-Prince in Haiti.

There is, however, renewed hope and a great opportunity to change the course of event in Haiti at least in two areas. First, the relative political and social stability in Haiti in recent years is a good sign. Second the commitment of the United Nations through the MINUSTAH and the

appointment of the UN envoy to Haiti. The danger would be to miss the opportunity to engage effectively in the long term, preventative and sustainable disaster management programs and strategies. The paper noted that such strategies have in the past been of less priority, which have for so long undermined minimal gains on the social, economic and environmental gains in Haiti, particularly in urban areas.

Another important point the paper has made is to depart from short term and casual interventions to a more sustainable and long term investment that will protect lives and property, thus avoid costly post interventions. The paper suggested that putting Haiti on the path of sustainable urbanization will require a partnership, adequate funding and cross-sectoral approach. This will mean departing from short-term projects and responses to preventative strategies that take into account some fundamentals such as insuring social and political instabilities, environmental restoration, employment creation, etc.

While the paper has not discussed the mitigation strategies, it pointed to some avenues for improving urban communities' adaptation capability through urban planning, in the context of city in poorest country such as Haiti. These include integration of climate change and natural disaster considerations, particularly adaptation measures, in urban development planning and strategies both at local and national levels.

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