**Port-au-Prince Water and Sanitation Project III**

**(HA-L1103)**

**Optional Link OEL#13**

**Contribution to IDB’s Goal to Increase Climate Finance**

**HA-L1103**

**(Version: September 6, 2017)**

During the preparation of the Port-au-Prince Water and Sanitation Project III, the IDB team and its counterparts at the Executing Agency in Haiti considered Haiti’s climate change challenges and the appropriate Program’s response. As a result, the Program addresses Haiti´s current and anticipated vulnerability to climate change and proposes targeted investments in the water and sanitation sector to reduce this vulnerability. As such, approximately 20.08% of the program´s resources are classified as Adaptation Finance, according to the Joint MDB approach to track climate finance.[[1]](#footnote-1)

1. **The context of vulnerability**

Haiti is highly vulnerable to climate change impacts.[[2]](#footnote-2) Managing the existing and future surface and subsurface water resources, and coping with current and future climate threats is critical to Haiti´s population, economic development and infrastructure. Historical data and projections, both at the national level and for specific areas and watersheds in the country, show vulnerability conditions that need to be addressed at the national and local levels. These include:

* *Temperature*

Haiti’s maximum and minimum temperatures show an upward trend. Historical records   
(1982-2010) indicate increases in both maximum and minimum temperatures. A recent analysis of temperature patterns for the Riviere Grise watershed within the Port-au-Prince influence area show an increase of 2.3oC in a 35-year period (1979-2014).[[3]](#footnote-3) National projections indicate increases in minimum, maximum and mean temperatures across all seasons of the year by the end of the century, irrespective of the climate scenario used. The mean country temperature (in degrees Celsius) will increase by approximately 0.8oC by 2020s, 1.1o C by 2030s, 1.9o C by 2050s and 3.3o C by the end of century.[[4]](#footnote-4)

* *Rainfalls*

Haiti has historically experienced significant year-to-year variability due to the influence of phenomenon like the El Nino Southern Oscillation (ENSO), with no overall decline in precipitation. However, in the past decades some areas of Haiti have experienced a decline in precipitation. For example, total rainfall in the Riviere Grise watershed declined by 37.5% during a 35-year period, from 3,200 mm in 1979 to 2,000 mm in 2014).[[5]](#footnote-5) Although national annual precipitation averages do not indicate drought conditions, current projections do raise concern. Climate models project an onset of a drying trend from the mid-2020s which continues into the 2030s, with 3 to 4 % less rainfall in the annual mean by the mid-2020s, and up to 6% drier by the mid-2030s. By the end of the century the country may be up to 20% drier for the most severe scenario. The decrease in summer rainfall is the primary driver of the drying trend.[[6]](#footnote-6)

* *Sea level rise*

In the past decades, sea level in Haiti rose at a low regional (Caribbean) rate of increase of   
0.18 mm/year (1950 - 2010), although it showed a higher rate of increase in the later years, of up to 3.2 mm/year (1993-2010). The Caribbean Sea level changes are near the global mean. The projections indicate a combined range for projected rise over all scenarios spans of 0.26 to   
0.82 mm/year by 2100 (relative to 1986-2005 levels). The range is 0.17-0.38 for   
2046 – 2065.Other studies suggest an upper limit for the Caribbean of up to 1.5 mm/year under RCP8.5 projections.[[7]](#footnote-7)

* *Hurricanes*

Over the past 25 years there has been a dramatic increase in frequency and duration of Atlantic hurricanes, with a sharp increase in category 4 and 5 hurricanes and in rainfall intensity, associated peak wind intensities, and mean rainfall. The most recent Hurricane (Matthew, October 2016, category 5) was the strongest hurricane to hit Haiti in 10 years, with winds of up to 150 mph and an accumulated rainfall of up to 670 mm (between October 3-5, 2016) in some areas of Haiti (West of Port au Prince), causing extensive physical damage, including water infrastructure and sanitation facilities. [[8]](#footnote-8) The national hurricane projections do not show significant changes in frequency of hurricanes, but they indicate a shift toward stronger storms by the end of the century, as measured by maximum wind speed increases (2-11%), increase in rainfall rates for the model hurricane’s inner core (20-30%), and an 80% increase in occurrences of Category 4 and 5 Atlantic hurricanes over the next 80 years (using the A1B scenario). [[9]](#footnote-9) Hurricane Irma (Sept. 4-7) is the latest Category 5 Hurricane to hit the Caribbean, the strongest hurricane recorded in the Northeastern Caribbean, with expected storm surges of up to 20 feet in some islands.

1. **Objectives and intent to address climate vulnerability and risks**.

The climate vulnerability conditions that Haiti has experienced historically and is expected to face in the future are important drivers of the investments proposed under the Program. Reduced water availability due to increasing temperatures and less rainfall, coupled with the limited capacity of the national and local governments to assure the operation and integrity of assure water reserves in reservoirs and aquifers require a more adequate response. The proposed operation and its components intend to improve management of surface and subsurface water resources, thus increasing the country’s capacity to cope with climate impacts. In the urban areas of Port-au-Prince, better articulation of surface and subsurface water, including reducing loses in the main distribution network and better catchments and storage infrastructure, will greatly help ensure current and future water supply. In the rural areas, investments in water services and protection of basic water infrastructure against flooding are critical, especially with highly-vulnerable poor populations who lack basic needs.

1. **Link between climate vulnerability objectives and specific project activities/components**.

In response to climate risks, the operation will direct investments to reduce water loss and improve the use of existing and future water resources in Port-au-Prince. The program’s adaptation activities that contribute to increase climate resilience in the water system in Haiti are the following:

1. *Investments in Urban Potable Water and Sanitation Works (Component III).*

This component will finance the construction and rehabilitation of water works aimed at improving water storage, distribution and expansion of the water network. It includes the construction of a large-diameter main water line to provide water service to the Carrefour and the central city areas. The new line will add flexibility and make a better use of surface and subsurface water distributed to area between Mariani and downtown. As part of the 17 km-long rehabilitation, a new line   
(6.5 km long, 600 mm diamater) will be built to link the Diquini tunnel with the Bolosse Reservoir. This line will eliminate water losses along this segment, which now account for 60% of total water loss in the Port au Prince water distribution system. The proposed investments will include design measures that enhance resilience to climate change, by taking into considerations the avoidance of, or minimal exposure to risks (slopes, erosion, landslides, flooding, etc.). In addition to this critical water supply line, new water storage facilities (tanks) in Mariani and Vivy Mitchell will increase significantly the city’s water reserves (now the water resources in the Mariani watershed are lost). The new Mariani and Vivy Mitchel deposits will have a 2000 m3 storage capacity each, and their construction will secure water volumes for the city and allow the city to increase the water service hours to 16 hours daily (in some area of the city there is only 3 hours of service). The total investments in the Diquini tunnel-Bolosse line and the Mariani and Vivy Mitchell storage deposits (a total of $8.300.000 of Component III) are classified as adaptation finance.

1. *Investments in Rural Water Works (Component IV)*

This component will provide resources for the emergency works needed to restore access to potable water in rural areas which were affected by Hurricane Matthew in the southern part of the country and Ile de la Gonave. The component will finance water systems emergency survey and planning, expansion or rehabilitation of potable water systems, protection of water sources and supervision of works in around 20 water systems. These systems will be built with technical specifications that will reduce future risks due to climate impacts. In addition, 20% of total costs of the 7 systems to improve access to water in rural areas of OREPA Ouest will account for climate adaptation investments (water efficiency measures and climate-resilient/ flood protection measures). The investments in this component that are classified as adaptation finance include: a) the total investments to restore access to potable water in areas affected by Hurricane Matthew ($3.000.000), with better rebuilding, more resilient infrastructure ; and 20% of total investments in the seven systems to provide service in OREPA Ouest ($700.000), with built-in adaptation measures that increase efficiencies in the water distribution system and use at households, as well as measures to protect the water infrastructure and household assets against climate adversities and risks. The total climate finance in this component amounts to $3.700.000.

1. *Support institutional strengthening to increase climate resilience (Component 1)*

This component will incorporate capacity building programs to mainstream climate resilience in CTE-MRPP and DINEPA planning and design activities. This may include a variety of programs to raise awareness, provide tools to better assess climate risk in water supply and distribution systems, and guide the adoption of climate adaptation measures and technologies. The total climate finance in this component amounts to US$250.000.

A total of US$13.053.000 (direct expenses and project administration), or 20.08% of the full IDB loan have been classified as adaptation finance.

1. [*metodología conjunta de los BMD de estimación de financiamiento climático*](https://publications.iadb.org/handle/11319/7807)<https://publications.iadb.org/bitstream/handle/11319/7807/2015-Joint-Report-On-Multilateral-Development-Banks-Climate-Finance.pdf?sequence=1&isAllowed=y> [↑](#footnote-ref-1)
2. Haiti: Historical and future climatic changes. IDB, 2015. [↑](#footnote-ref-2)
3. Data generated by IDB’s hydrologic modelling tool HydroBID, based on Meterological data points used in the NCEP Climate Forecast System Reanalysis (NCEP-CFSR). [↑](#footnote-ref-3)
4. Haiti: Historical and future climatic changes. IDB, 2015. [↑](#footnote-ref-4)
5. Data generated by IDB’s HydroBID. [↑](#footnote-ref-5)
6. Haiti: Historical and future climatic changes. IDB, 2015. [↑](#footnote-ref-6)
7. Haiti: Historical and future climatic changes. IDB, 2015. The RCP8.5 combines assumptions about high population and relatively slow income growth with modest rates of technological change and energy intensity improvements, leading in the long term to high energy demand and GHG emissions in absence of climate change policies. Compared to the total set of Representative Concentration Pathways (RCPs), RCP8.5 thus corresponds to the pathway with the highest greenhouse gas emissions. [↑](#footnote-ref-7)
8. <https://data.humdata.org/dataset/accumulated-gpm-imerg-data-for-haiti-hurricane-matthew-october-3-6th-2016>

   <https://www.theguardian.com/world/2016/oct/06/hurricane-matthew-haiti-rescuers-battle-reach-remote-areas> [↑](#footnote-ref-8)
9. Haiti: Historical and future climatic changes. IDB, 2015. [↑](#footnote-ref-9)