

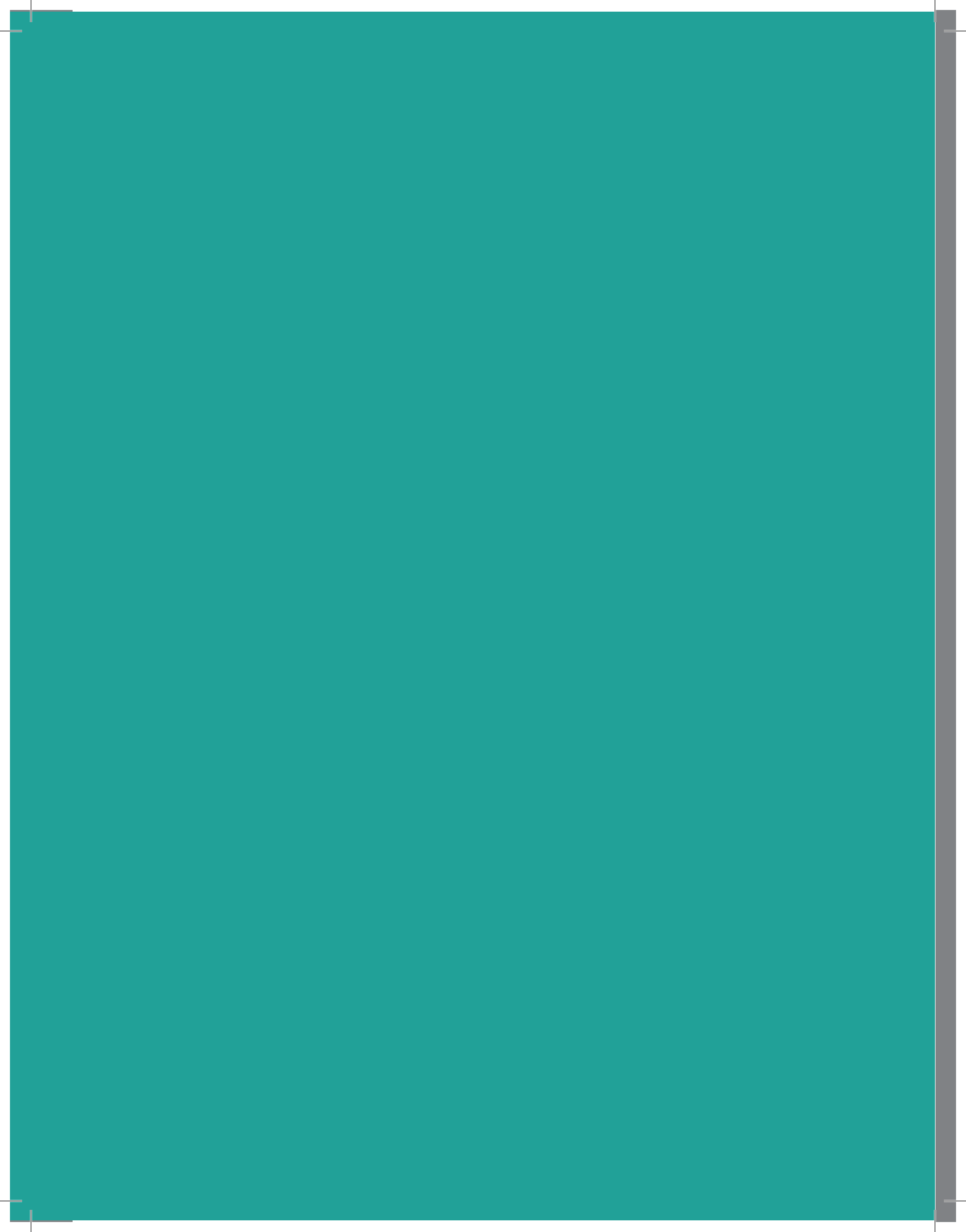
CLEAN WATER, IMPROVED SANITATION, BETTER HEALTH

HAITI CONFERENCE

Conference Paper

Washington D.C. October 9, 2014





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THURSDAY, OCTOBER 9, 2014



This Working Paper aims to frame discussions at the Haiti Conference on Clean Water, Improved Sanitation and Better Health to be held in Washington DC on October 9, 2014. It is the product of technical teams of the Government of Haiti (Ministry of Public Works, Ministry of Public Health and Population, and DINEPA Water authority), the World Bank Group, and the United Nations. The views presented herein are those of the staff, not the official views of their institutions.

INTRODUCTION

The Government of Haiti and its Partners are deeply committed to providing clean water and better sanitation and achieving better health outcomes for the Haitian population. This will particularly help the two million Haitians living in the areas most affected by cholera outside of Port-au-Prince and 2.5 million inhabitants of the capital without adequate water services. In the context of the Government's 10 year plan to Eliminate Cholera in Haiti and its Total Sanitation Campaign launched in July 2014, this Conference aims to promote investments in water and sanitation and the continuation and consolidation of health service delivery provided in response to the Cholera epidemic. These investments and services are critical in preventing new outbreaks of serious waterborne diseases. In addition to protecting the Haitian population permanently from the resurgence of Cholera and other similar diseases, investment in water and sanitation infrastructure and services will significantly lower the mortality rates of Haitian children under five, reduce the incidence of diarrheal disease, and improve productivity for all.

OBJECTIVES

Participants in the Conference are coming together to generate attention around water, sanitation and health needs, to promote timely collective action, and to commit resources for investments in the communes most affected by Cholera. This effort aims to support and is framed by the Government's 10 year plan for the Elimination of Cholera and the objectives of Haiti's Total Sanitation Campaign, while focusing on a first tranche of priority communes.

COSTING

This paper draws upon underlying work by DINEPA, MSPP, and the World Bank who in (the summer of 2014) costed the needs for water, sanitation and health services in the 20 communes of Haiti with the highest incidence rates of Cholera during the last two dry seasons, and by the Government and UNICEF which costed much needed rural interventions in each of Haiti's departments during the preparation of the Total Sanitation Campaign. Stock taking of investments already in place and forthcoming in the rest of the country is ongoing and was reflected in the costing assessment where possible.

The costing presented here covers 16 priority communes drawn from the two costing exercises mentioned above. It contemplated interventions in healthcare delivery, epidemiological surveillance and health promotion, as well as urban and rural water supply infrastructure, urban sanitation infrastructure (fecal sludge management), urban and rural institutional and household-level sanitation, and corresponding recurrent costs for a period of three years. Field missions and unit costs per type of intervention based on experience and recent operations in Haiti were used to estimate the costs of these interventions.

It is estimated that US\$310 million, of which US\$228 million for WSS and US\$82 million for health are needed to fund investments and to cover recurrent costs in health and water and sanitation over the next three years to substantially increase access to services and reduce deaths from diarrheal diseases (including cholera) in a set of 16 priority communes. Another US\$70 million is needed for investments in Water Supply in Port-au-Prince over the next three years.

CONFERENCE DOCUMENTATION

MAP: Conference documents include a map of the priority communes for intervention nationwide and Port-au-Prince. The 16 communes were selected as follows: the commune in each department with the highest cholera incidence rate as well as six national priority communes in terms of registered cholera cases (6 communes in the most affected departments of Centre and Artibonite). These 16 communes are a subset of the 55 communes selected by the Government of Haiti as priority targets for support in the 2014 Total Sanitation Campaign.

Paper: The present paper summarizes the criteria for commune selection and the methodology used to estimate the required investment and recurrent costs. It aims to serve as analytical background for the work of the Conference and as a point of reference for priority, scale, and cost. However, partners are encouraged to share their ongoing work and provide investment in any geographical area of the country. Estimates for the needs of Port-au-Prince are derived from the Government Port-au-Prince Master Plan for water supply, supported by Inter-American Development Bank (IDB).

Background Documentation: Government of the Republic of Haiti, World Bank, UNICEF, IDB, and USAID materials and studies will be made available online at: www.worldbank.org/en/events/2014/09/30/haiti-clean-water-improved-sanitation-better-health

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ACRONYMS

ACPS:	Health Community Agent (<i>Agent Communautaire Polyvalent de Santé</i>)
CAEPA:	Water Supply and Sanitation Committee (<i>Comité d'Approvisionnement en Eau Potable et Assainissement</i>)
CTE:	Technical Operating Centers (<i>Centre Technique d'Exploitation</i>)
DINEPA:	Haiti's National Directorate of Water Supply and Sanitation (<i>Direction Nationale de l'Eau Potable et de l'Assainissement</i>)
MSPP:	Ministry of Public Health and Population (<i>Ministère de la Santé Publique et de la Population</i>)
OREPA:	Regional Water Supply and Sanitation Office (<i>Office Régional d'Approvisionnement en Eau Potable et Assainissement</i>)
OSE:	Epidemiological Surveillance Officer (<i>Officier de Surveillance Épidémiologique</i>)
TEPAC:	Communal Water Supply and Sanitation Technician (<i>Technicien en Eau Potable et Assainissement Communal</i>)
U5MR:	Under-five Mortality Rate
URD:	Departmental Rural Unit (<i>Unité Rurale Départementale</i>)
WPE:	Water Point Equivalent
WSS:	Water Supply and Sanitation

EXECUTIVE SUMMARY

Water-borne diseases are a leading cause for mortality of children in Haiti. In addition, Haiti has faced one of the most severe cholera outbreaks in modern history, and despite the significant reduction in the new number of cases and deaths, the disease remains endemic. The epidemic has cost over 8,500 lives and infected over 800,000. Today, a united front to combat cholera provides a unique opportunity for the Government and its partners to accelerate the access of Haitians to water, sanitation and health services in the vulnerable areas of the country, many of which are also among the poorest.

After the 2010 outbreak, effective control measures were put in place. However, substantial additional investments in health and water supply and sanitation (WSS) are essential to further control and prevent cholera, as well as to reduce the overall impact of waterborne disease in Haiti and to ensure that many of Haiti’s poorest people reap the health and productivity benefits which access to adequate water and sanitation services will bring.

This paper evaluates the cost of interventions over the next three years in health and WSS to control water-borne disease for a set of 16 priority communes (c16) identified by Government and Partners. These include the most vulnerable commune in each department (selected by Government in the context

of the total sanitation campaign) and for six communes that have proven the most vulnerable during the cholera epidemic on the basis of high incidence rates and alerts from January 2013 to May 2014 (including the origin of cases whenever available) in the dry seasons of 2012 and 2013. Special attention is also needed for greater Port-au-Prince, where a tranche of the master plan for the capital should be implemented over the upcoming three year period.

The initiative to raise awareness and funds is aligned with the Government of Haiti’s 10 -year Cholera Elimination Plan and with Haiti’s Total Sanitation Campaign launched in mid-2014 which focuses on 55 communes, including the 16 priority communes identified here.

Combining improvements in access to water and sanitation and access to healthcare is the most effective way to control and prevent cholera and other water-borne diseases. Health interventions concentrate on epidemiological surveillance, healthcare delivery, stock management, community-level promotion, food hygiene, and sanitation of health facilities. WSS interventions focus on infrastructure and the delivery of clean water and improved sanitation to households, health facilities, schools and rural markets. We estimate the interventions proposed would reach almost two million residents in the 16 priority communes and a further 2.5 million in Port-au-Prince.

Summary Table

Three Year Costing – Prevention and Containment of water borne diseases and Cholera 16 most affected communes and Port au Prince

Elimination of water borne diseases	Investment Costs (total in million)	Recurrent Costs (per year)	Recurrent Costs (three years)	Total Costs (Three years)
Health – 16 C	US\$35.5M	US\$15.5M	US\$46.5 M	US\$82.0
Water – 16 C	US\$218.1M	US\$3.3M	US\$9.9M	US\$228.0
Total – 16 C	US\$253.5M	US\$18.8M	US\$56.5M	US\$310M
Water – PaP¹	US\$70M	n/a	n/a	US\$70M
Total 16C+PAP				US\$380M

¹ Based on the estimated investment needs for the next three years in the Port-au-Prince Metropolitan Region Water Supply Master Plan. The Study did not conduct a field based assessment for Port-au-Prince.

Investing in eliminating cholera will have important spillover effects by building a more responsive health system and strengthening WSS infrastructure for long term improvements in poverty and public health. Such actions will impact a wide spectrum of water-borne diseases—a leading cause of child mortality. Improvements in health and WSS will also contribute to poverty reduction, particularly by reducing productivity losses (due to illness and death) in the country's poorest populations.

This paper estimates that a three-year program of cholera control in communities of the c16 would require US\$ 310 million of which US\$ 82 million for Health and US\$ 228 million for water and sanitation. This includes investment expenditures and recurrent costs for three years for both sectors as set out in the table above. It is estimated that US\$ 70 million in capital investments could also be absorbed to improve water supply infrastructure in the Port-au-Prince area, bringing the **total required for the next three years to US\$ 380 million.**

BACKGROUND

COUNTRY SOCIO-ECONOMIC CONTEXT

- Haiti possesses strategic advantages but also faces considerable challenges.** Its position in the middle of the Caribbean, proximity to the United States, young labor force, and rich cultural heritage offer a wide range of economic opportunities. However, Haiti's population of 10.4 million (52% of which live in rural areas) remains poor: 58.7% of Haitians live in poverty, and 24% in extreme poverty, with GDP per capita at US\$820 in 2013. Haiti is one of the most densely populated countries in Latin America and the population is highly concentrated in three departments: Ouest (36.9%, mainly urban and includes the Metropolitan Region of Port-au-Prince), Artibonite (15.8%, mainly rural), and Nord (9.8%). The highest poverty levels are found in rural areas: 63% of extremely poor households reside in the rural areas, where basic services are severely lacking.
- In spite of the devastating consequences of the 2010 earthquake, health outcomes have improved during the past decade.** In spite of the 2010 earthquake—which cost over 230,000 lives and impaired the state apparatus, the under-five mortality rate Under 5 mortality rate (U5MR) dropped by 11%, maternal mortality dropped by 23%, and life expectancy increased by 3.5 years, between 2005 and 2012. These positive changes have been mirrored by improved health service utilization: coverage of Oral Rehydration Therapy (ORS) and vaccination, both of which are key to reducing child mortality, improved

by 32% and 10%, respectively over the same period. Maternal health services utilization improved as well, with a 64% increase in institutional deliveries over the same period. Nevertheless, Haiti still faces challenges in health outcomes: life expectancy is the lowest in the region and the Under 5 mortality rate (U5MR) is nearly six times the regional average of 16. Additionally, access to healthcare in Haiti is low: 60% of the population lacks access to basic healthcare.

- Access to water supply and sanitation (WSS) in Haiti is low** with 62% for access to an improved water source and 31% for access to improved sanitation facilities. These figures hide a sharp divide between urban and rural areas, where basic services are severely lacking: access to water is 75% in urban areas for 47% in rural areas, while access to sanitation stands at 55% and 16% in urban and rural areas, respectively.² The water sector in Haiti was reformed in 2009 with the creation of the National Water and Sanitation Directorate (DINEPA). While this reform is generally viewed as a major improvement on previous arrangements, challenges remain in sector financing, in terms of infrastructure and human resources, strategic planning and prioritization, as well as in monitoring and evaluation.

² According to the WHO-UNICEF 2014 Progress report on Water and Sanitation, an improved drinking water source is one that, by the nature of its construction, adequately protects the source from outside contamination, particularly fecal matter. An improved sanitation facility is one that hygienically separates human excreta from human contact.

Table 1: Epidemiological Evolution of Cholera in Haiti, 2010-2014

Year	Oct-Dec. 2010	2011	2012	2013	June 2014	Total
Cases	185,351	352,033	101,722	58,650	7,451	705,207
Deaths	4,101	2,927	927	572	32	8,559
Fatality Rate	2.2%	0.8%	0.9%	1.0%	0.4%	1.2%

Source: MSPP Government Site¹⁵

EVOLUTION OF CHOLERA ENDEMICITY

- Haiti has faced one of the most severe cholera outbreaks in modern history which began in November 2010, just ten months after the devastating earthquake that struck the country.** This was the first massive cholera outbreak in Haiti in more than 100 years. To date, the cholera epidemic has claimed more than 8,500 lives and affected more than 700,000 people (see Table 1). Although important advances have been made in cholera control (in 2014, 32 people have died from the disease), the risk of another epidemic spike remains.
- Control measures have been effective, but cholera still poses a significant threat.** Table 1 provides a depiction of the downward evolution of the cholera epidemic. Indeed, the table reflects a success in dampening the disease, both in terms of new cases and deaths. A swift national and international response has considerably cut the disease spread and fatality – virtually by half each year. The number of cases has decreased from a monthly average of 29,336 in the first full year of the epidemic (2011), to 1,240 through this last year. The number of deaths has decreased correspondingly (from 4,101 in the first year to an expected 64 this year). Yet, after three years, Haiti still deals with cholera and the path to elimination requires sustained action from the government and development partners to work on a sustainable solution. This requires maintaining and strengthening surveillance and rapid response actions, which have been effective in lowering cases and deaths, while increasing investments to improve access to water and sanitation for a longer terms solution. The most effective ways of preventing,

controlling and ultimately eliminating cholera involve multisectoral interventions to improve access to healthcare, and strengthening the public water and sanitation system.

INSTITUTIONAL CONTEXT

- Tackling cholera has required a coordinated response, which has been spearheaded by the Ministry of Public Health and Population (MSPP) and the National Directorate of Water Supply and Sanitation (DINEPA).** These two organizations have gradually strengthened their collaboration since the beginning of the epidemic. In addition, the Regional Coalition for Water and Sanitation to Eliminate Cholera in the Island of Hispaniola was established in June 2012 by the Pan-American Health Organization/World Health Organization (PAHO/WHO), UNICEF and the U.S. Center for Disease Control and Prevention (CDC) to mobilize international support for major investments in WSS as the best means of eliminating transmission of cholera. The Coalition comprises more than 20 members including the Inter-American Development Bank and the World Bank, and provides technical expertise on cholera control and elimination to the governments of Haiti and the Dominican Republic.
- The cholera partnership interventions have greatly diminished the cholera threat.** The interventions from the cholera partnership have pivoted around the following key strategies:
 - Establishment of an inter-ministerial unit responsible for resource mobilization and policy engagement by the different sectors;

- Creation of a Steering Committee responsible for coordination with all partners;
 - Strengthening of the epidemiological surveillance system and implementation of a national system of notification of cholera cases;
 - Awareness campaigns to promote hygiene, safe food-handling and other public health preventive practices;
 - Provision of cholera treatment through local health services and international NGOs;
 - Training of health personnel in the zones affected by cholera;
 - Improved access to safe drinking water – chlorination at the source, in households, internally displaced person (IDP) camps, schools, markets, etc. and improvement of excreta and solid waste management;
 - Vaccine pilot projects.
- Given the vulnerability of the current health system, if these activities are not sustained and the essential public health functions are not strengthened, the progress achieved may be compromised.

Nevertheless, concurrent and substantial improvements in water supply and sanitation coverage and service quality are needed, starting with medium-term investments targeted strategically and specifically at high incidence and high risk zones.

NEED FOR SUSTAINED ACTION

- 8. Despite of these positive outcomes, sustained interventions in health and water and sanitation are needed.** During the spike of the disease, the Government and its partners have concentrated on the emergency response to successfully contain and prevent the disease. However, efforts need to continue to strengthen health and water and sanitation systems to sustain the results achieved. Since Cholera transmission has not been eliminated in an environment of very limited access to clean water and sanitation, the potential of a new spike remains.
- 9. Rapid response, prevention and treatment activities need to continue while water and sanitation infrastructure is built and service delivery can be improved. This includes:**
 - Epidemiological Surveillance (fundamental for effective rapid response)
 - Rapid Response Teams (multisectoral teams responding to cholera alerts)
 - Health and hygiene promotion (mainly through community agents)
 - Availability of Oral Rehydration Therapy (ORT)
 - Distribution of chlorinated products and hygiene kits where needed
- 10. Cholera prevention and control measures will also help control other waterborne diseases, and will have an important impact on child mortality. Tackling cholera requires effective healthcare to save the lives of those infected, and robust water and sanitation to halt its spread (by eliminating the disease reservoirs).** Such a strategy would contribute to the elimination of a whole spectrum of waterborne diseases, which are the primary cause of death amongst infants. Improving water, sanitation and hygiene has the potential to prevent 10.2% of Haiti's disease burden (in disability-adjusted life years or DALYs, a weighted measure of deaths and disability), or 9.5 % of all deaths in Haiti, particularly in children under five years of age. The 2012 Mortality, Morbidity and Use of Health Services Survey indicates that 21% of children under five had had diarrhea in the two weeks preceding the survey, and 11% of deaths among children under five are attributable to diarrhea. Additionally, most reported cases of diarrhea for these children were in rural areas with 62%.
- 11. Controlling water-borne disease will contribute to improving the health outcomes and make Haiti's poorer communities more resilient.** As seen in Haiti, national disasters can have a strong impact on a country's development. Despite a positive trend between 2005 and 2009, when the GDP grew annually by 2.3%, the 2010 earthquake stopped Haiti's growth, and caused damages and losses evaluated at around US\$11 billion or 120% of GDP. Boosting the health and WSS capacity creates a stronger platform to not only be prepared for such disasters (including epidemics), but to ultimately contribute to reducing poverty (particularly for the bottom 40% of the population) and improving the lives of the poor.

12. Investments in WSS have multiple benefits beyond cholera and the prevention of other waterborne diseases, including having a strong impact on productivity and income, cognitive development, educational attainment, as well as time and opportunity costs, particularly for women, small children and vulnerable populations. The impacts of improved WSS access on welfare are multi-faceted

and may be indirect; however, by providing better access to improved WSS to poor households, benefits – from the easily identifiable and quantifiable (coping costs avoided, time saved) to the more intangible and difficult to measure (living standards, health, well-being, environmental protection) – can be substantially increased.

THE COSTING STUDY IN 16 COMMUNES (C16): METHODOLOGY

OVERVIEW

13. Cholera elimination remains a national priority.

The MSPP and DINEPA launched in 2013 a 10-year Cholera Elimination Plan. This plan estimates the costs of cholera elimination—which includes health as well as WSS interventions—at US\$2.2 billion over the next ten years (2013-2022). The operationalization of this long-term plan requires breaking it into short-term tranches, and the MSPP and DINEPA have published a two-year implementation plan which broadly describes cholera nationwide interventions to be implemented. These interventions center around four key axes: (i) epidemiological surveillance, (ii) healthcare delivery, (iii) community-based promotion, and (iv) access to safe drinking water and sanitation.

14. **The current costing study is in line with the interventions presented in Haiti’s National Cholera Elimination Plan.** The World Bank supports the Haitian Government’s cholera elimination efforts and its medium-term strategy to this end includes (i) mapping the cholera red zones, (ii) assessing health service availability, (iii) assessing the WSS situation in terms of infrastructure and service delivery, (iv) costing interventions in cholera red zones, and (v) bringing partners together. The first four interventions are the subject of the current study which also serves as a key instrument to align partners around a common strategy for preventing and controlling cholera and other waterborne diseases.

15. **The study contemplates cholera control interventions in 16 priority communes in terms of cholera incidence (i.e. cholera red zones).** The current cost study used a three-year horizon and presents the needed investment costs, as well as associated recurrent costs for the next three years. The methodology used contains detailed information on data sources, cost calculation and assumptions used for this exercise. The study does not take inflation into account given the short time frame. All figures are in US\$.

SELECTION OF THE C16 COMMUNES

16. **The c16 communes³ were selected based on cholera incidence as well as geographic criteria, i.e. each department must be represented by at least one commune.** The main criterion to select the communes was cholera incidence (i.e. number of alerts and new cases per population) recorded from January 2013 to May 2014. The selection criteria also used a study that tracks back the cases to their communes of origin during the dry season whenever possible. This is important since reported data records where the patient was treated rather than the commune of origin of the patient (i.e. where the disease was contracted).

³ The official subnational divisions in Haiti are (i) region, (ii) department, (iii) commune and (iv) section communale.

Table 2: 16 selected communes

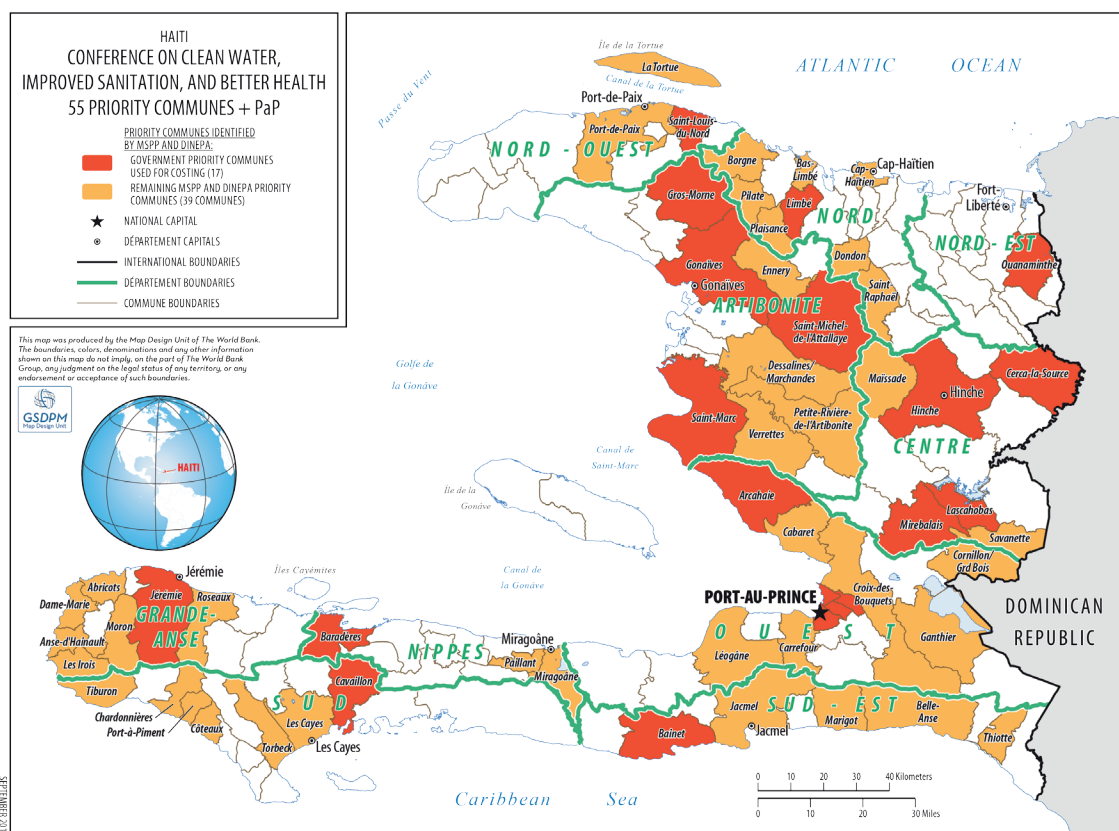
Department	Commune	Urban population (%)	Rural population (%)
Artibonite	Gonaïves	75.2	24.8
Artibonite	Gros Morne	22.7	77.3
Artibonite	Saint Marc	56.6	43.4
Artibonite	Saint Michel de l'Attalaye	23.8	76.2
Centre	Cerca La Source	13	87
Centre	Hinche	30.5	69.5
Centre	Lascahobas	21.6	78.4
Centre	Mirebalais	18.5	81.5
Grande Anse	Jeremie	32.6	67.4
Nippes	Baraderes	10.7	89.3
Nord	Limbe	61.9	38.1
Nord-Est	Ouanaminthe	63.7	36.3
Nord-Ouest	St Louis du Nord	32.4	67.6
Ouest	Arcahaie	50.4	49.6
Sud	Cavillon	4.5	95.5
Sud-Est	Bainet	4.4	95.6

By intervening in the communes of origin, important disease reservoirs can be eliminated, controlling the spread of the disease. This analysis was carried out at the departmental level and considered at least one priority commune per department, thus, resulting in the selection of 10 communes. In addition, given that Center and Antimonite are the departments with the highest incidence overall, three communes with high incidence were further selected for each of these two departments. The resulting 16 communes are a subset of the 20 priority communes selected by the government for the total sanitation campaign (out of

a total 55). Table 2 shows the list of communes and their proportion of rural and urban population.

- Beyond the communes selected, other communes in the Ouest, particularly Port-au-Prince, have shown large case numbers during the 2012 and 2013, including the rainy season. Incidence for 2014 is likely to be much lower as overall number of cases has dropped dramatically since 2013. Nevertheless, the Water Supply Master Plan for the Port-au-Prince (PaP) Metropolitan Region estimated the investments needs for the next three years to US\$ 70 million.

Figure 2: 55 Priority Communes of which (in red) 16 Communes and Port au Prince for Priority Intervention in 2015-2017



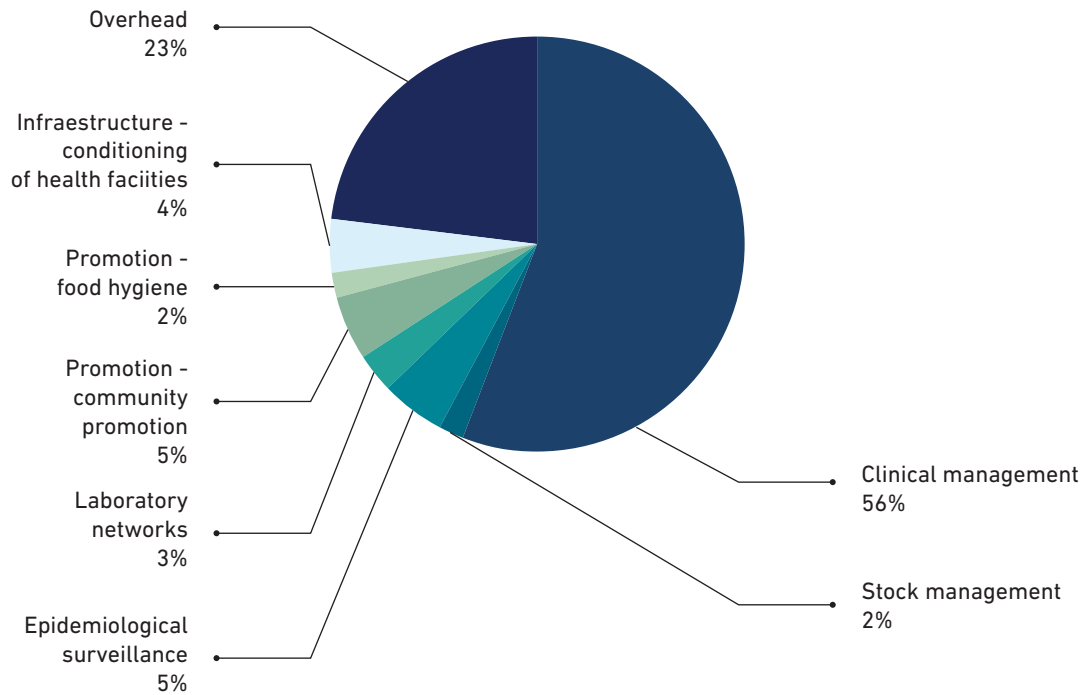
RESULTS

HEALTH COSTING RESULTS

18. The health costing is in line with the two-year Cholera Eradication Plan from MSPP/DINEPA and contemplated interventions in (i) healthcare delivery (subdivided into clinical management of cholera and stock management); (ii) epidemiological surveillance (strengthening of community surveillance and laboratories); and (iii) health promotion (community promotion, food hygiene, and conditioning of health facilities). An incremental approach was used, i.e. the costing is based on the interventions to be implemented in addition to those already ongoing.
19. Over the next three years, the total health costs of eliminating cholera in the c16 communes will

add up to US\$ 82 million. This figure breaks up into US\$ 35.5 million for (one time) investment costs; US\$ 15.5 million yearly recurring costs. This estimate assumes that Haiti stock piles enough medicines to cover a cholera spike similar to that of 2011, which was the worst year of the epidemic (356,000 cases). It is therefore the most conservative estimate; alternative scenarios are also possible. Calculations reveal that if Haiti were instead to prepare for a moderate epidemic (i.e. 101,000 cases, as in 2012), total health costs would decrease to US\$ 70 million (US\$ 12 million decrease). Finally, if Haiti chooses not to prepare an emergency stock, the health grand total would decrease to US\$ 66 million (US\$ 16 million decrease vs. most conservative scenario). These figures illustrate that the level of emergency

Figure 3: Relative importance of health costs per category



preparedness assumed has a high impact on the health costs of treating cholera. Table 3 presents the health costs by category and Figure 3 provides an overview of the health costs in percentages.

WSS COSTING RESULTS

20. Table 4 below summarizes the cost estimates for each type of WSS intervention. Costs include delivery of infrastructure and the associated costs which include engineering designs and supervision of works, social mobilization and capacity building of DINEPA's decentralized structures and support to local WSS actors. Figure 4 provides an overview of the relative importance of the WSS cost items
21. Additionally, the recurring annual costs to support the WSS infrastructure and the related services include: (i) US\$ 2,100,000 for salaries and operating costs for TEPACs (commune level), URDs (department level) and OREPAs (regional level); (ii) US\$ 700,000 for household water treatment products (for the first three years, during which engineering works would

be initiated and implemented); and (iii) US\$ 500,000 for drainage canal clearing and cleaning in the large urban areas of Gonaïves and Saint Marc. The total recurrent costs are estimated at US\$ 3,300,000 per year.

22. It is to be noted that these costs reflect the assumptions presented in the methodology of c16 cost study. The estimates provided were largely based on historical costs of similar infrastructure and preliminary and detailed engineering designs would be required for the costs to be ready for tender.
23. The cost estimate in this study reflects how much is needed to effectively prevent cholera and other waterborne diseases in the 16 most affected communes and improve conditions in the PaP area. Work is ongoing to identify investments and recurrent cost from partners on the ground in those communes and areas to precisely identify and localize financing gaps.

Table 3: Summary of health costing results

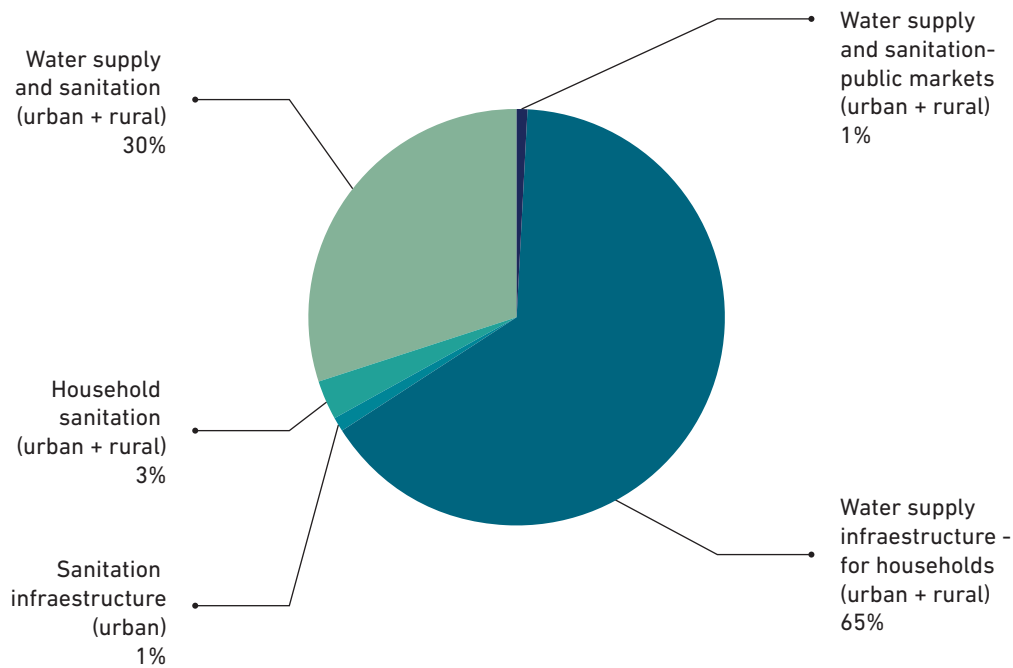
Intervention	Investments (one time) Cost	Recurrent	Main cost items
		Costs (per year)	
Epidemiological surveillance	1,293,340	1,006,100	-Communications for epidemiological surveillance -Reinforcement of IT systems
Clinical management	21,575,505	8,518,249	-Additional staff salaries -Cholera Preparedness: stock piling (one time) for emergencies (conservative scenario) and reserve fund
Stock management	1,214,610	31,540	-Purchase of cold chain equipment -Warehouse conditioning/transportation systems
Laboratory networks	1,220,632	417,782	Hiring of staff, purchase of inputs and equipment, and publication of norms
Promotion – community promotion	107,600	1,568,860	-Proximity events -Billboards
Promotion – food hygiene	199,200	384,000	-Food inspector salaries
Infrastructure – conditioning of health facilities	2,061,140	97,200	-Construction and rehabilitation of water sources within health facilities -Acquisition of incinerators and incinerator supplies -Construction of sanitary blocks and latrines
Overhead	\$7,828,768	3,489,639	
Total ⁵	\$35,500,795	\$15,513,370	

5 Per our calculations, vaccinating one million people (50% of total population in those areas) should be enough to achieve herd immunity in endemic areas and would cost US\$7.5 million. Costs include vaccine acquisition, administration, and related communication campaigns (proximity events and radio broadcasts). The vaccination costs are not included in the costing study because, according to field experts, it is very unlikely that one million vaccinations will be made available over the next two years. In fact, vaccinating one million people would require two million doses (two doses per person), which is equivalent to the current world stockpile.

Table 4: Summary of cost estimates for WSS interventions

Investment Expenditure	Cost estimate (US\$)
Urban water supply infrastructure	17,000,000
Rural water supply infrastructure	105,000,000
Urban sanitation infrastructure	
• Fecal sludge treatment plants (cities)	3,500,000
• Fecal sludge treatment centers (agglomerations of smaller towns)	400,000
Urban and rural household-level sanitation	
• Urban	2,000,000
• Rural	5,000,000
Water supply and sanitation in schools	
• Water supply	48,000,000
• Sanitation	31,600,000
Water supply and sanitation in public markets	
• Water supply	3,600,000
• Sanitation	2,000,000
Total Investment Cost Over 3 years	218,100,000
Recurrent Expenditure	Cost estimate (US\$)
Salaries and operating costs TEPACs	205,000
Salaries and operating costs URDs	995,000
Salaries and operating costs OREPAs	900,000
Household treatment products	700,000
Drainage of Canals in Gonaïves, St. Marc	500,000
Total Recurrent Cost per year	3,300,000 per year
Total Recurrent Cost For 3 years	9,900,000

Figure 4: Relative importance of WSS investment costs per category



CONCLUSION

TOTAL COST OF HEALTH AND WSS INTERVENTIONS IN C16 AND INVESTMENTS NEEDS IN WATER SUPPLY IN PAP

24. Health and WSS interventions for the next three years in the c16 communities will require an investment of US\$ 310 million, broken down as follows: US\$ 35.5 million for health investments, US\$ 218.1 million for WSS investments, as well as US\$ 18.8 million of recurrent costs per year (US\$ 15.5 for health and US\$ 3.3 million for WSS). Another US\$70M is needed for investments in Water Supply in Port-au-Prince over the next three years.
25. Expressed in per-capita terms, the cost of these interventions adds up to US\$ 163 (US\$ 43 for health

and US\$ 120 for water and sanitation).⁶ If expressed in cost per year, the cost would be US\$ 14 and US\$ 40 for health and water and sanitation respectively, requiring US\$ 54 yearly in total per person. Table 5 presents the costs at the commune level.

Additionally, the Water Supply Master Plan for the PaP Metropolitan Region estimated the investments needs for the next three years to US\$70 million, increasing the total to US\$ 380 million.

⁶ The WHO's CHOICE initiative uses gross domestic product (GDP) as a readily available indicator to derive threshold values of cost-effectiveness. With a per capita cost less than the GDP per capita (\$US7820 in Haiti), the interventions presented in this study are considered to be highly cost-effective. See http://www.who.int/choice/costs/CER_thresholds/en/.

Table 5: Total costs of health and WSS interventions in the c16 priority communes, including annual recurring costs for the next three years

Department	Commune	Population	Health Costs	Water and Sanitation
Artibonite	Gonaïves	340,042	\$14,900,000	\$26,300,000
Artibonite	Gros Morne	148,577	\$6,500,000	\$18,900,000
Artibonite	Saint Michel de l'Attalaye	254,458	\$11,000,000	\$17,000,000
Artibonite	Saint Marc	143,634	\$6,500,000	\$22,400,000
Centre	Cerca La Source	22,191	\$990,000	\$8,600,000
Centre	Hinche	115,344	\$5,000,000	\$18,000,000
Centre	Lascahobas	43,776	\$1,900,000	\$8,200,000
Centre	Mirebalais	93,288	\$4,100,000	\$14,700,000
Grande Anse	Jeremie	128,178	\$5,510,000	\$19,500,000
Nippes	Baraderes	39,361	\$1,700,000	\$5,800,000
Nord	Limbe	81,403	\$3,500,000	\$8,400,000
Nord-Est	Ouanaminthe	101,280	\$4,500,000	\$10,500,000
Nord-Ouest	St Louis du Nord	111,033	\$4,800,000	\$13,600,000
Ouest	Arcahaie	124,352	\$5,500,000	\$16,300,000
Sud	Cavaillon	46,462	\$2,000,000	\$7,500,000
Sud-Est	Bainet	82,791	\$3,600,000	\$12,300,000
Total		1,907,928	\$82,000,000	\$228,000,000

*Note that the total in the table includes recurrent costs for three years.

SUPPORT REQUESTED FROM PARTNERS

26. Support is solicited from partners for contributions to the realization of the above mentioned priority investments of US\$ 310 million in the 16 priority communes and US\$ 70 million in Port-au-Prince. More

broadly, the conference welcomes any contributions to water and sanitation investments and services, as well as the consolidation of health activities with a view to prevent and control waterborne disease, including the resurgence of cholera, and promote health and development outcomes.

27. The presented interventions in health and water supply and sanitation aim not only at preventing and controlling cholera, but also at increasing their impact to a wider spectrum of waterborne diseases. This would in turn yield positive outcomes in terms both of health (by reducing a predominant cause of child mortality) as well as poverty reduction (by avoiding productivity losses due to illness and death) for Haiti.
28. Evidence shows that: (i) diarrhea causes more deaths in children under 5 than HIV/AIDS, malaria and measles combined; (ii) one dollar invested in sanitation the Latin America and Caribbean region produces US\$ 7.2 in return, as well as direct healthcare savings and productive days gained, (iii) an estimated 50% of childhood malnutrition is associated with repeated diarrhea or intestinal nematode-related diseases; and (iv) investments in WSS increase school attendance by reducing time spent collecting water, promoting health outcomes and improving hygienic conditions, especially for girls.
29. To contribute to this effort, the World Bank will contribute through a continuation of its investments in Health Systems Strengthening (US\$ 90M over 5 years) and through new financing from IDA 17 in the order of US\$ 50M for water and sanitation services in rural areas and small towns in priority communes.
30. Partners are invited to provide information on ongoing activities and potential contributions and to present their support for the stated objectives at the Conference's high level session on October 9, 2014.

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