

## Short Communication

# Development of Haiti's rural water, sanitation and hygiene workforce

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### ABSTRACT

In 2009 the Haitian Directorate of Potable Water and Sanitation (DINEPA) identified an inadequately trained and under-staffed rural workforce as one of their main institutional challenges. Plans to address this challenge were impacted by the devastating earthquake of January 12, 2010 and the cholera outbreak of October 2010, both of which further complicated Haiti's already poor water and sanitation conditions. Recognizing the importance of DINEPA's institutional priorities, donor and technical assistance groups provided needed support to improve the country's conditions and build the rural water and sanitation workforce. This report describes how DINEPA and the US Centers for Disease Control and Prevention (CDC) collaborated to design and implement a training program for 264 potable water and sanitation technicians for rural areas. The paper also describes the initial field activities of the newly trained technicians and the immediate impact of their work in the rural water, sanitation and hygiene sector.

**Key words** | cholera, Haiti, sanitation and hygiene, water quality, water, workforce development

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### INTRODUCTION: WATER, SANITATION AND HYGIENE CHALLENGES IN HAITI

In 2009 the Haitian Directorate of Potable Water and Sanitation (DINEPA) was established by the Haitian Government to reform, regulate and develop the country's water, sanitation and hygiene (WASH) sector (DINEPA

2011). Achieving this goal was complicated by the devastating earthquake of January 12, 2010 and the cholera epidemic that began in October 2010. Prior to the earthquake Haiti already had the lowest water and sanitation coverage in the Western Hemisphere and was the only country in the world to have experienced lower sanitation coverage between 1995 and 2010 for reasons other than population decline (WHO/UNICEF 2012). By September 8, 2013, there were 675,216 cases and 8,261 deaths (MSPP 2013) in Haiti related to

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cholera, making it the largest cholera epidemic for any country on record (PAHO 2012).

DINEPA worked to address the critical water and sanitation situation throughout the country, but did not have the human resource capacity to do this effectively (DINEPA 2012). On average, there were only seven DINEPA staff members stationed in each of the country's 10 departmental rural units (URDs), and they were located in each department's urban center (DINEPA 2012). DINEPA needed a trained workforce to be present in every commune in the rural areas to ensure the safety of drinking water, increase access to improved sanitation facilities, and promote hygiene (communes are third-level administrative subdivisions in Haiti; the 10 departments have 42 districts that are further divided into 140 communes). To address their institutional challenges and respond to the on-going cholera epidemic, DINEPA requested technical assistance from the US Centers for Disease Control and Prevention (CDC) to build their rural water and sanitation workforce.

## MATERIALS AND METHODS: ESTABLISHING A RURAL WATER, SANITATION AND HYGIENE WORKFORCE

In 2011 DINEPA and CDC began developing the Potable Water and Sanitation Technicians for the Communes (TEPAC) Program, and created its vision: a workforce that would dramatically expand DINEPA's scope and effectiveness nationally (the TEPAC program was funded by the Inter-American Development Bank, the Spanish Agency for International Development Cooperation, the World Bank, and the Centers for Disease Control and Prevention). Placing two TEPACs in each of the country's 133 rural communes would improve DINEPA's access to local water committees and water sources nationally, particularly the more remote rural communities. Box 1 outlines the TEPACs' key roles and responsibilities in the communes.

In 2011 and 2012, CDC developed a 2-week long training course for the TEPAC program, and met with DINEPA representatives to review the content and verify that it was consistent with existing DINEPA guidelines and field practices (see Table 1).

### Box 1 | The Role of DINEPA's Potable Water and Sanitation Technicians for the Communes

To support the regional and departmental water and sanitation offices, the TEPACs' activities include:

- Working to inventory and assess rural drinking water systems.
- Monitoring the risks that affect those drinking water systems.
- Improving management of systems and sources, and strengthening communication and reporting of results.
- Identifying key WASH actors in the communes, and building collaborative relationships with these individuals and organizations.
- Mobilizing local communities and promoting communication between community water and sanitation committees and DINEPA's Departmental Rural Units (URDs).
- Educating community members in the principles and techniques of household water treatment and safe storage, safe sanitation, and proper hygiene practices.
- Serving as DINEPA's point of contact in the communes during emergency response events.

Each module contained PowerPoint presentations, student and instructor guides, and suggested examination questions to assess participants' understanding of the material. The training materials also included lab exercises, activities for field visits to community water systems, and a final exam (which was not standardized but developed specifically for each department based on the trainer's judgment). The materials were then presented in a Train-the-Trainers session to approximately 20 of DINEPA's WASH specialists from the URDs who had been selected to implement the training in their departments. All materials produced for the trainings were made available in English and Haitian Creole. In the summer and fall of 2012, DINEPA conducted the TEPAC trainings in each of Haiti's 10 departments.

**Table 1** | Potable Water and Sanitation Technicians for the Communes (TEPAC) training program modules

Module topic	Description
DINEPA institutional framework	Provides key information about employment with DINEPA
Principles of water quality	Highlights the WHO framework for drinking water and explains the role of the TEPACs
Water associated diseases	Lists specific diseases classified as water-borne, water-washed, water-based and water-related
Groundwater flow	Emphasizes the concept of groundwater and promotes understanding of factors affecting storage and flow of groundwater
Environmental sampling methods	Presents the role of environmental sampling, lists essential equipment, describes typical water quality tests and sampling protocols
Principles of water supply infrastructure	Provides a basic understanding of water supply infrastructure and function
Sanitary inspection	Explains the value of sanitary inspection and provides specific guidance on conducting sanitary assessment
Household water treatment and safe storage	Describes the concept of safe water and introduces several methods and disinfecting agents for household drinking water
Water quality testing I: measuring free chlorine residual	Offers step by step, visual instruction for measuring free chlorine residual using a color disc test kit with reagent
Water quality testing lab and practice	Suggests ideas for setting up field experiences to promote competence of technicians measuring free chlorine residual
Disinfection of small distribution systems	Provides information on disinfecting agents, explains how to calculate disinfectant dosage, and suggests methods for disinfection of community systems
Chlorine demand and jar test	Describes the jar test methodology and how to determine proper dosage to obtain expected free chlorine residual
Formation of local water committees	Presents guidance related to the DINEPA requirements for establishing a local water and sanitation committee
Sanitation	Lists different sanitation technologies and the suitability for each technology based on environmental conditions
Hygiene	Emphasizes importance of water disinfection, handwashing and practicing safe sanitation
Emergency response	Relates all the potential roles and responsibilities of an environmental health specialist during an emergency or disaster event related to water and sanitation
Cholera	Emphasizes lessons learned from early efforts to mitigate the spread of cholera in Haiti

## TRAINING RESULTS

The DINEPA TEPAC coordinator and trainers decided to only administer quizzes after the delivery of each training module (listed in Table 1) and conduct a comprehensive final exam after all training modules had been delivered. Trainers did not administer a pre-test exam. The results of the quiz scores and final comprehensive exams were averaged across all departments and training modules. The final, country-wide results and analyses were shared with all trainers after the departmental trainings were completed. The DINEPA TEPAC Coordinator and trainers

were particularly interested in understanding where TEPACs had performed well, and where they had scored the lowest to indicate how additional training resources should be directed. Evaluation of lowest scoring examination results from the training indicated that many TEPACs would benefit from additional training on ground water flow, disinfection of small water systems, and sanitary inspections. However, field visits to small water supply systems conducted after the delivery of the abovementioned training modules demonstrated that TEPACs' understanding of these topics would improve with continued practice.

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## RESULTS FROM INITIAL FIELD ACTIVITIES OF DEPLOYED TEPACS

By March 2013, 264 TEPACs had been trained and deployed to 133 communes throughout Haiti. Their first task was to conduct a baseline inventory of their commune, including the water infrastructure, community water committees and community health workers present in the area. This work was essential in helping DINEPA identify critical needs and set key priorities in the rural WASH sector. The DINEPA Rural Water and Sanitation Department expanded staffing to include a monitoring and evaluation specialist to support the TEPAC Coordinator. The addition of monitoring and evaluation support allowed DINEPA to begin designing an online monitoring and evaluation system to document, analyze and report results from all field data collected by the TEPACs. DINEPA also made preparations to train the TEPACs on how to report their data electronically via smartphone and GPS devices. Based on feedback from the TEPAC field experiences, DINEPA has also identified the need for more targeted trainings on issues such as sanitation, household water treatment and safe storage, and emergency response.

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## DISCUSSION

Since being deployed in late 2012 and early 2013, the TEPACs have become an integral part of DINEPA's national water and sanitation strategy, and are now recognized across the country as being essential to DINEPA's plan to eliminate cholera (Republic of Haiti 2013a, b). In addition to providing DINEPA with a baseline understanding of the WASH conditions in the rural areas, the TEPACs have started dialogue with other WASH actors in their communes as a way to promote collaboration and transparency. Finally, the TEPACs are the driving force behind DINEPA's process of decentralizing the water and sanitation sector. The TEPACs are located in the communes, therefore very close to the communities and the local authorities. The agency's long-term goal is to have the sector managed by the local governments in each commune with oversight from DINEPA's four regional offices. The TEPACs receive technical support from DINEPA at the

regional and departmental level, and are simultaneously being integrated into their local municipalities, thus advancing DINEPA's long-term goal of decentralization. Future assessments of the TEPAC program should consider how data collected by the TEPACs are used to improve rural water sources, and whether the use of smartphones for reporting data from rural locations directly into a central database has been feasible. To understand decentralization efforts, assessments should also describe how TEPACs, with the continued support from DINEPA regional offices, have been integrated into local municipal governments.

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## CONCLUSION

The TEPAC program was essential in providing Haiti with a national water and sanitation workforce, one that did not previously exist at the commune level. The deployment of the TEPACs throughout Haiti expanded DINEPA's influence and presence in the rural areas, and was a critical step in ensuring a standardized strategy for safe water and sanitation provision throughout the country. Coordinating activities in each commune will be a key benefit for all future WASH work managed by the Government of Haiti as well as both local and international organizations.

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## DISCLAIMER

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of CDC.

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