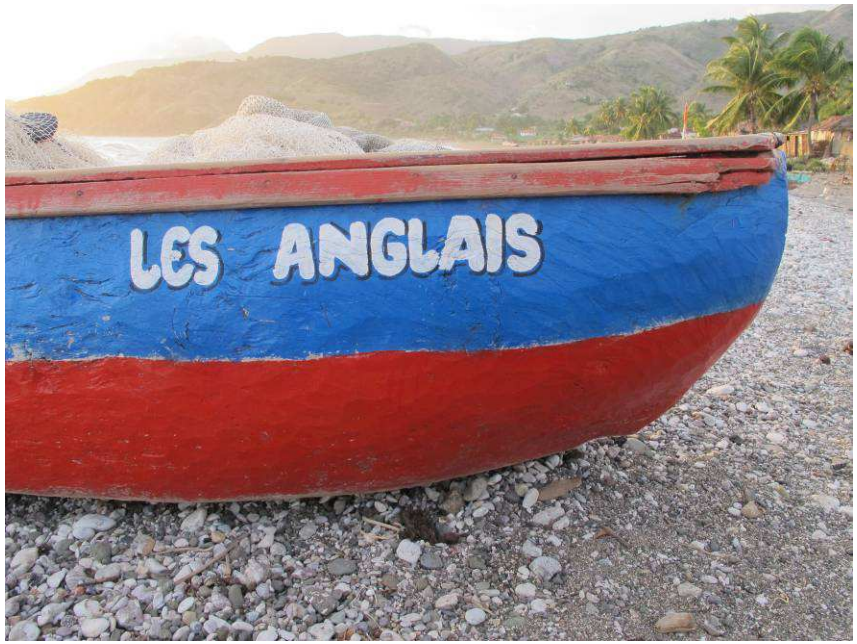
ASME Haiti Well Project

March – April 2011

Haiti, the Country

- Haiti occupies the western, smaller portion of the island of Hispaniola
- Haitian Creole and French are the official languages
- Haiti's population was about 9.8 million according to UN 2008 estimates
- About 66% of all Haitians work in the agricultural sector, which consists mainly of small-scale subsistence farming

Les Anglais, Haiti



Coffee and Mangoes are two of Haiti's most important exports


CUMMINGS ELEMENTARY


LES ANGLAIS


WEST POINT

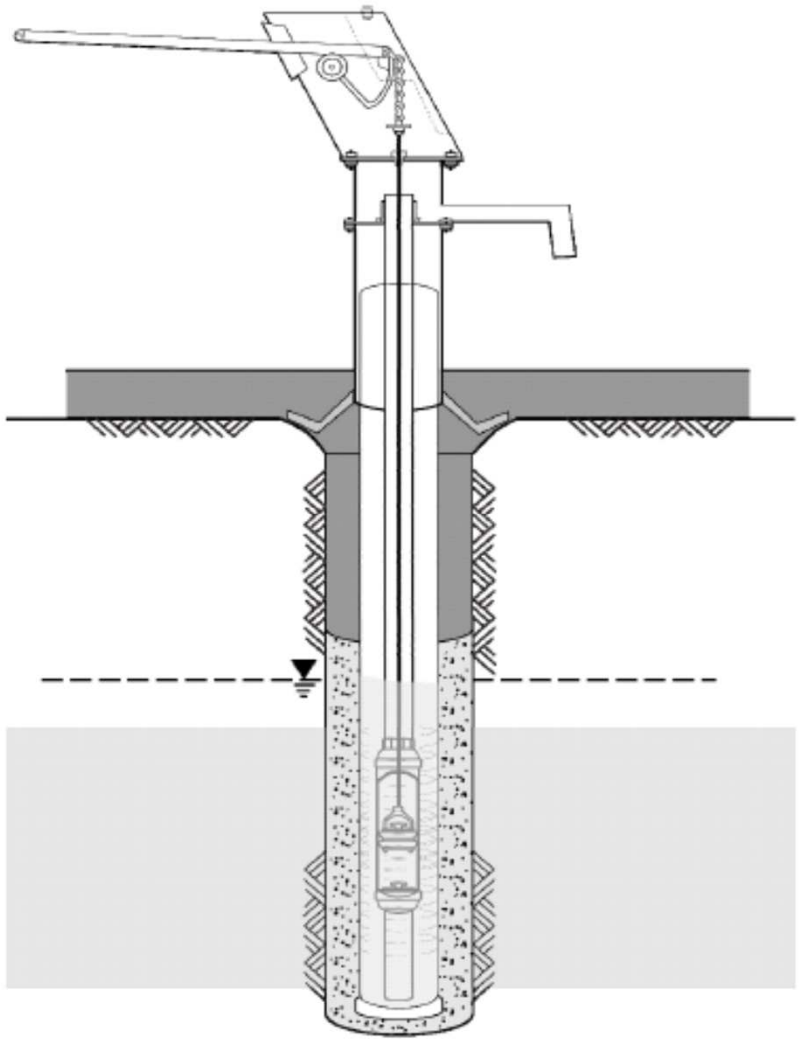
Goals of ASME Trip to Haiti

- Establish Well Locations
- Identify Pump make and model
- Pump Performance Test
- Train local well board members on pump repair
- Geologic Samples and Locations

- 11 Well Locations in Les Anglais, Haiti

Typical Well Construction

- Well Head
- Riser Main Pipe
- Pump Rod
- Well Cylinder
- Borehole Casing
- Well Screen
- Gravel Pack
- Aquifer



Typical Deep Well Pump Cylinder

- Well Cylinder
- Piston Valve (Traveling Valve)
- Foot Valve
- Tail Pipe

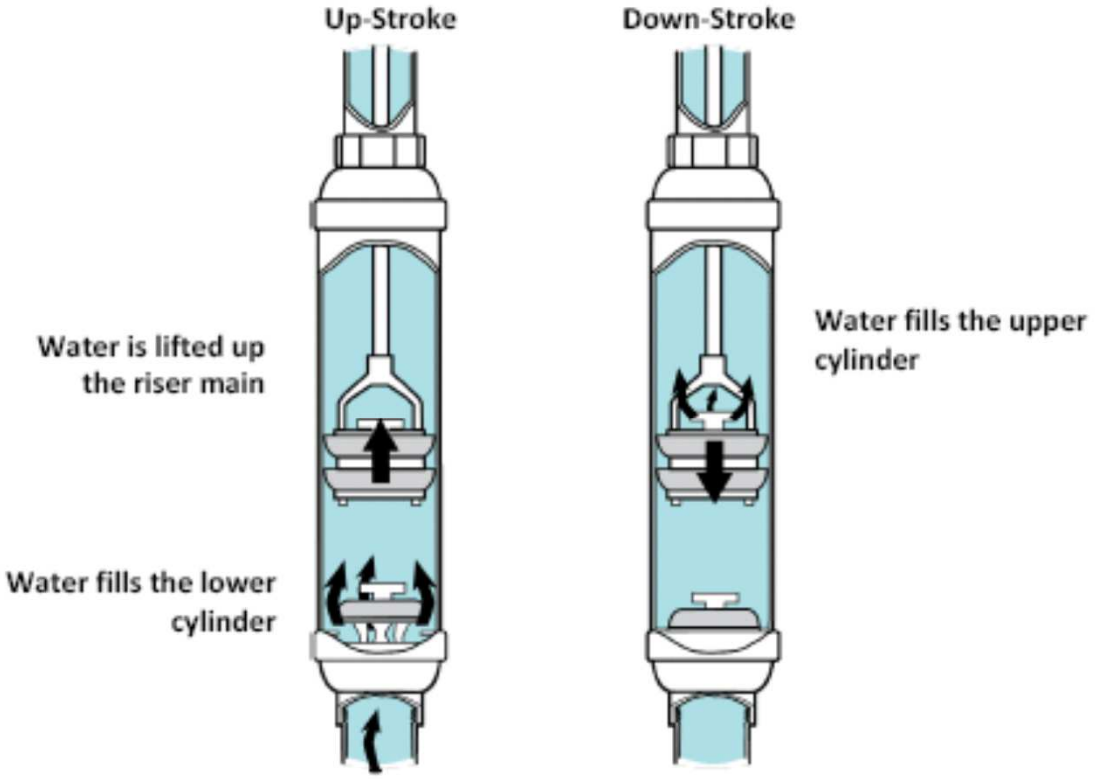


Figure 6 Pump Cylinder Operation

Pump Performance Test

Hand Pump Performance Testing Procedure*

Pump Test:
1. Operate the pump until water comes out of the spout.
2. Place a bucket under the spout and then pump 40 full strokes.
3. Measure and record the volume pumped.

[Alternative: Count the number of strokes to produce 20 liters (5 gallons).]

Leak Test:
1. Let the pump be idle for five minutes.
2. Count the number of strokes before water comes out again.

Table 1 Pump Performance Ratings

	Pump Test	Leak Test
OK	>10 liters	<5 strokes
Poor	<10 but >3 liters	>5 but <10 strokes
Broken	<3 liters	>10 strokes

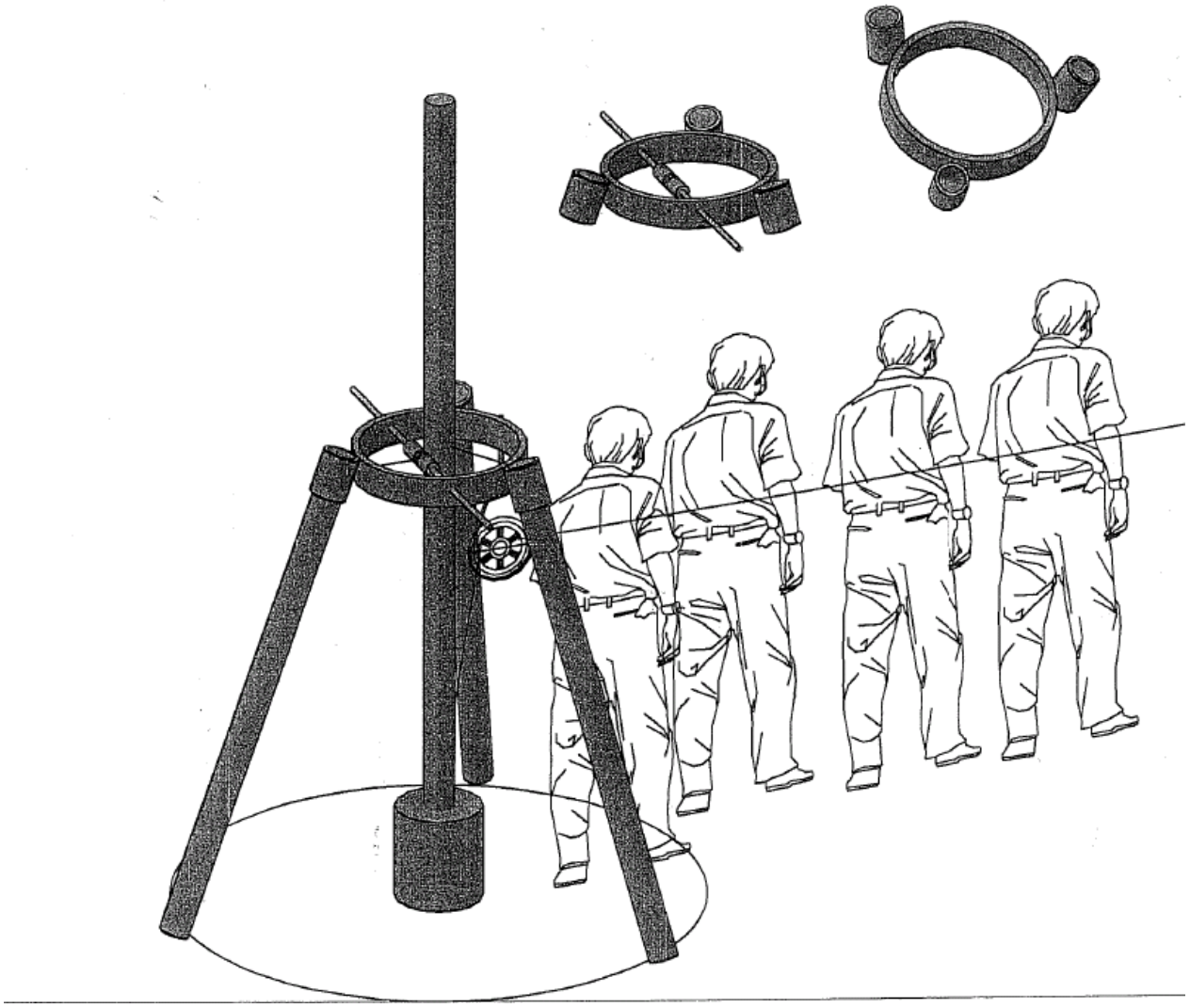
*Source: *Kjellerup, Brent and Asimah, S.E. "Hand Pump Performance Monitoring" proc. 26th WEDC Conference, 2000.*

- Average 40 strokes to fill 5-gallon bucket
- Average 57 seconds to fill 5-gallon bucket
- Leak Test – All < 5 strokes

Groundwater Data

- Water Temperature = 79°F to 84°F
- pH = 6.5 to 7.0
- Turbidity = Clear
- Previous Testing for Pathogens - Negative for E. coli and Choliform Bacteria
  (However, positive in Health Clinic Tank and Mountain Reservoirs)

Proposed Method to Pull Riser Pipe



Health Clinic Repairs

Geology for Siting Future Wells

- Haiti's terrain consists mainly of rugged mountains interspersed with small coastal plains and river valleys

Charcoal

- Estimated 98% of its original forest cover has been deforested, much of as fuel for cook stoves.
- Demand for charcoal accelerates this deforestation

Source: United Nations Food and Agriculture Organization

Political Uncertainty and the Return to Port-au-Prince.

On April 4, 2011 the Provisional Electoral Council announced preliminary results that Michel Martelly had won the presidential election.

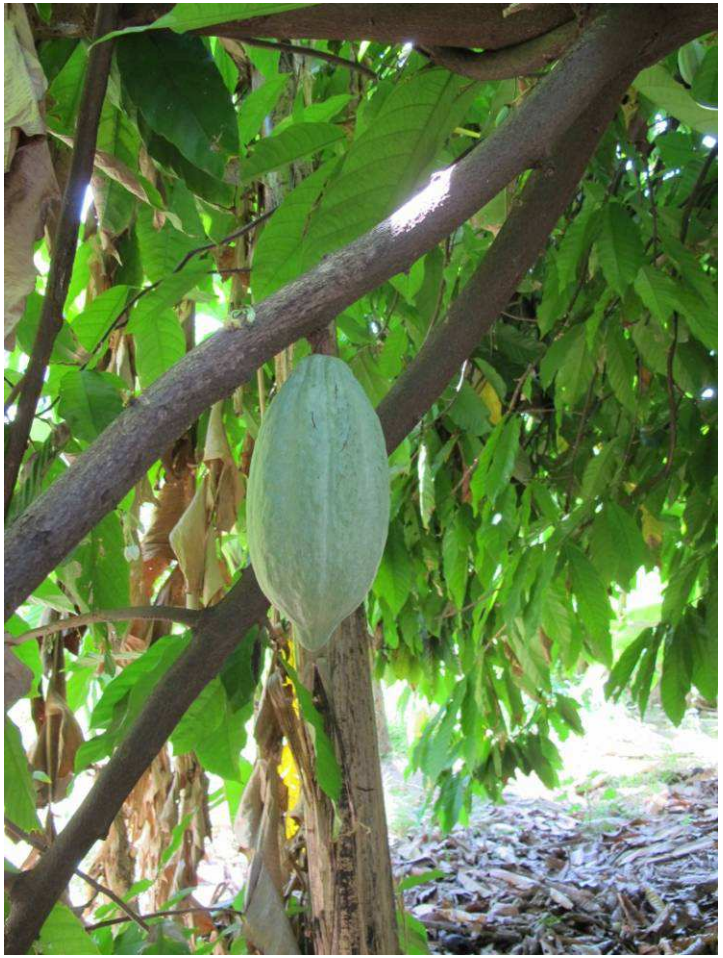
Political Uncertainty to Celebration

Tap-Tap
Local (Colorful) Public Transport

Market to Table

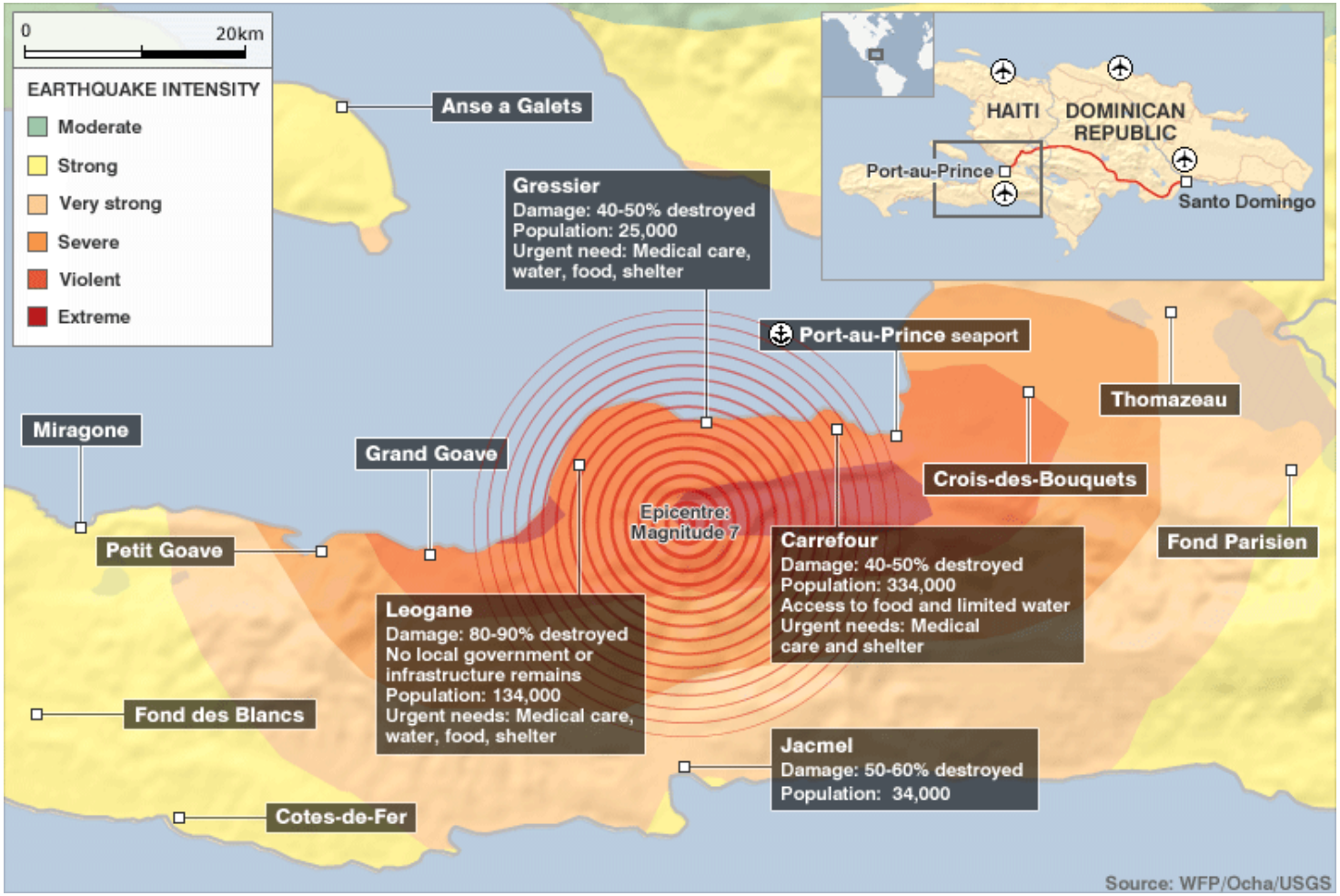

Prestige

Haitian Chocolate



Earthquake, Magnitude 7.0

January 12, 2010



National Palace


UN
UN
UN 24509

Goals of a Future ASME Trip to Haiti

- Return with replacement parts for pump repair
- Provide basic tools to repair pumps + tool box + lock
- Work with local well board to repair pumps

Gratitude to those making this trip possible

- ASME, Idaho Chapter - Haiti Project Volunteers
- Karen Moore, Haiti Project Lead
- Jon Kofler, Volunteer
- Joel Hubbell, Hydrogeologist
- Junior, Haitian Driver and Translator
- Engineers Without Borders - Portland Chapter
- Carolyn Shapiro