

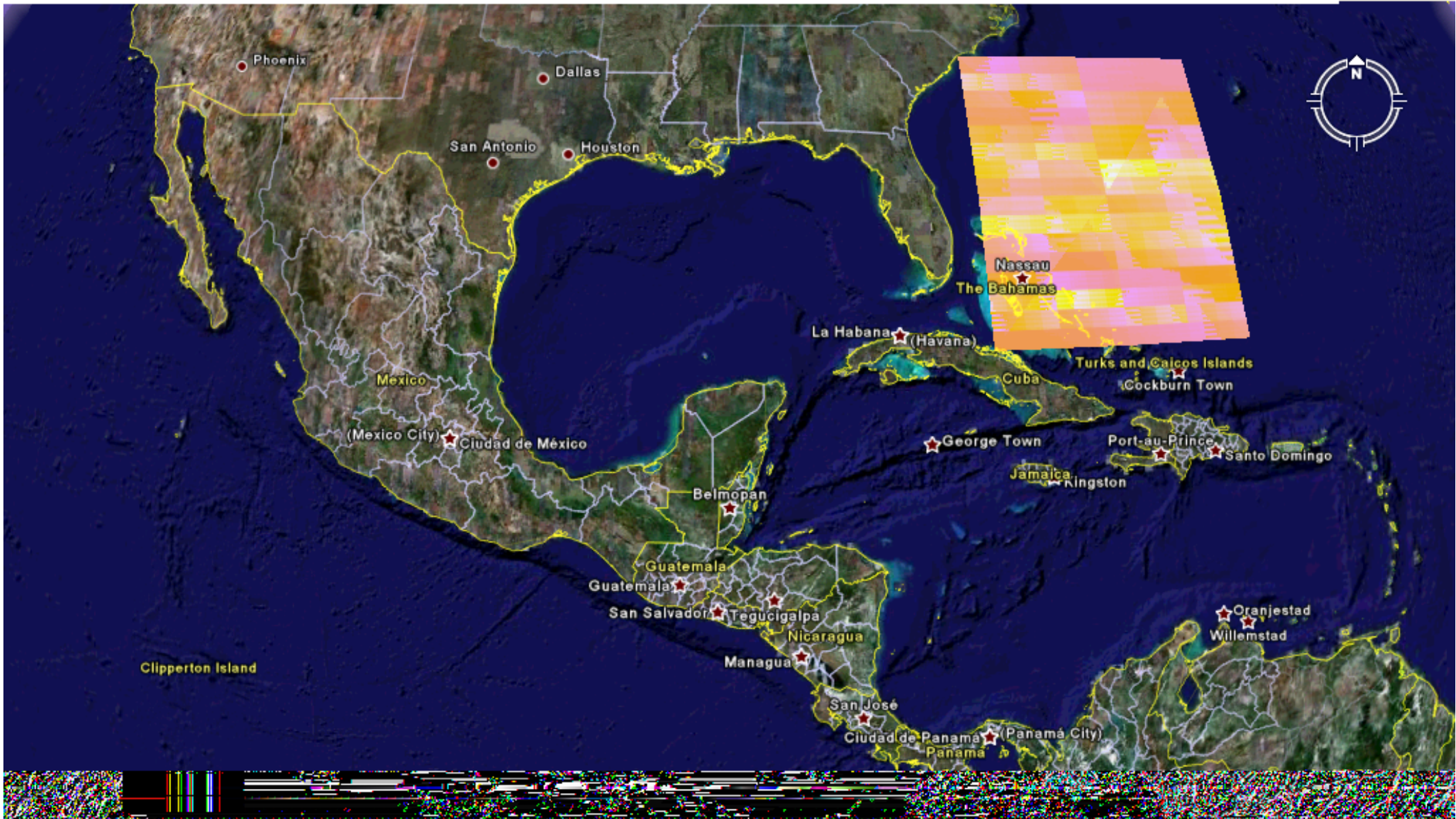
Country's Presentation!

GENEVA MARCH 14 – 15, 2011

Roland Rivers,

*WATER ENGINEER
Water and Wastewater SECTOR
Public Utilities Commission*

Belize, Central America



The Location and Climate of Belize

- Situated on the Caribbean coast of Central America with Mexico to the North and Guatemala to the west and south.
- It lies between 15°45' and 18°30'N and 87°30' and 89°15'W.
- The terrain is low and flat along coastal areas and in some northern regions of the country while in the central and southern regions low mountains rise gradually to a height of 3,685 feet.
- The climate of Belize is characterized by two seasons: a rainy and a dry season.
- In Belize, most of the year's rainfall occurs during the period June to November, that is, the rainy season.
- ***Mean annual rainfall across Belize ranges from 60 inches (1524mm) in the north to 160 inches (4064mm) in the south.***



- Country size – 8,866 Sq. Miles – 5541.25 Sq. Kilometers.
- Population of 320,000.
- A mixture of Creole, Garifuna, Mestizo, Maya, English, Spanish, Mennonite, Lebanese and Eastern Indian.
- Language -English
- Spanish and other dialects are widely spoken
- Currency – The Belize dollar - exchange rate of BZ\$2. to US\$1.
- Climate – Sub-tropical

The Barrier Reef of Belize

The 2nd Largest in the World



- Belize boasts the 2nd largest Barrier Reef in the world and the largest in the western hemisphere. The reef spans the full length of the country of Belize from north to south – 186 miles

Tropical Forest

- 40% of the country is under some form of conservation management
- Belize boast the only Jaguar Preserve in the world
- Over 540 species of birds, exotic wildlife and mysterious caves.



Public Utilities Commission

- Established in 1999 under the Public Utilities Commission Act.
- The first autonomous authority with responsibility for regulating the electricity, water and telecommunication sectors.
- Responsible for ensuring utility customers have safe, reliable and high-quality services at affordable rates.
- The investor receives a reasonable return on investment.
- Safeguard the public's interest.
- The multi-faceted role of the PUC creates a dynamic, but solidly regulated utilities sector.

Water Production in Belize

- Belize Water Services Ltd. – all urban areas and some rural villages.
- 12 Systems – Surface and Groundwater.
- Covers 66% of the total population.
- Rural Village Systems – Managed by Rural Water Boards.
- Approximately 125 systems.
- Approximately 95% coverage of the Rural Populace with potable water.

Belize Water Services

- **Belize Water Services Limited is the water and sewerage utility for the country of Belize.**
- **Regulatory controls include a statutory regulator, the Public Utilities Commission, the Water Industry Act (2001), an operating License issued by the PUC and a “Code of Practice” agreed by the Regulator and BWS in 2004.**

INCREASED PRODUCTIVITY THROUGH BETTER HEALTH PROJECT

**‘GOOD PRACTICES’
RELATED TO ACCESS TO
SAFE DRINKING WATER
AND SANITATION**

Increase Productivity Through Better Health Project IPTBH

- United States Agency for International Development (U.S.A.I.D) was the Funding Agency.
- Planning began in 1984 and implementation began in 1986.
- PRAGMA – MCD was the Contracting Agency from out of the United States assisting with the implementation.
- The Rural Water Supply and Sanitation Programme under the Ministry of Natural Resources was the implementing agency.
- The Water and Sewerage Authority (W.A.S.A) was responsible for rudimentary water systems design.

RWSSP/IPTBH

- A Program Manager heading the unit.
- A Chief Health Educator and an assistant at the main office in Belize City.
- A District Coordinator, Health Educator and Carpenter Foreman in each district.
- A well rig fully manned with an operator, assistant and two helpers in each district.
- Three Maintenance Crew

THE IPTBH PROJECT

- Included three Districts: Cayo, Stann Creek and Belize Districts.
- Individual household survey of all villages in all three districts.
- Selection criteria for water and sanitation project to be implemented in villages.
- Criteria for Rudimentary Water System and hand pumps according to population size and cost effectiveness.
- Ventilated Improved Pit (V.I.P) latrines was part of the selection criteria.

IPTBH Project (cont.)

- Once a village is chosen a meeting is held to reconfirm their acceptance.
- A Village Agreement and an Individual Household Agreement is then implemented.
- For the Water and Sanitation Project to be implemented at least 70% of the households in the respective village must have signed the Individual Agreement.
- A Water Group is then formulated and trained to oversee the implementation of the project.

IPTBH Project (cont.)

- Eighty percent (80%) of the project is funded by U.S.A.I.D and the other twenty percent (20%) is in-kind contribution in the form of labor from the community.
- For water systems labor includes digging of trenches and laying of pipes with supervision from the District Coordinator and Engineer from W.A.S.A.

IPTBH PROJECT (cont.)

- For sanitation the Carpenter/Foreman supervises the construction of slabs and out-house.
- Community is responsible for labor in the digging of pit, construction of slabs and seats and the construction of the out-house.

HEALTH EDUCATION

- A comprehensive Health Education Program was developed to ensure sustainability of the water and sanitation project.
- At least two months prior to construction this program was implemented.
- Includes sensitizing the community, training of water group

AVAILABILITY - WATER

- Shallow wells providing minimum 75 gallons per minute for water system.
- Twenty four hours per day supply.
- Belize has an abundance of groundwater with very good quality.
- Acceptable water source must be found before project approval.

AVAILABILITY - SANITATION

- Construction of Ventilated Improved Pit latrines – could be dug holes or raised structure according to geological formation.
- Initial materials provided by the project.
- Materials for repairs and maintenance available nearby at minimal cost.
- Most people own the property where they reside.

ACCESSIBILITY – WATER AND SANITATION

- Water – Distribution network takes piped water three feet into property. Owners can then do their own connection into home.
- Sanitation – Each household constructs a V.I.P latrine. Double available according to the family size.

AFFORDABILITY – WATER

- A tariff (flat rate) is set when the system is designed. This cover all operating expenses.
- The system is the property of the Government of Belize.
- Managed by a Water Board consisting of seven members.

AFFORDABILITY - SANITATION

- Proper maintenance of the latrine.
- Slab and seat made of ferro-cement concrete.
- Outhouse can be repaired with local materials available in the forest.

QUALITY/SAFETY - WATER

- Chlorination/disinfection is the treatment preferred. Systems are equipped with small chlorinators.
- Water quality testing is done quarterly by the Ministry of Health.
- Sanitary Inspection should be done annually by the Ministry of Health.

QUALITY/SAFETY - SANITATION

- School Health Education.
- Continuous education by the District Health Educator during and after the construction phase.
- Households began construction of septic tanks due to the accessibility of water.
- Wash hand basins with soap encouraged to be placed outside the latrine.

ACCEPTABILITY - WATER

- Disinfection of the water with chlorine causing a slight change in taste is the biggest obstacle. Health Education at school and community levels is the key factor.
- People are accustomed to drinking rainwater and the untreated surface water from the river.
- Color and odor are not problems encountered.

ACCEPTABILITY - SANITATION

- Difficult for the Mayas (Indigenous people) to accept the V.I.P latrines as they were accustomed to using the nearby bushes and the kids right on the property.
- At first latrines were used to store grain.
- Condemnation of pork carcass and education of the farmers/butchers began the process of the Mayas utilizing the latrines.

NON-DISCRIMINATION

- Survey/questionnaire implemented in all villages of the three districts.
- Main focus is on “Poverty Alleviation”.
- Women are fully involved in the process for both water and sanitation as they are the main users of these facilities.

FREE AND MEANINGFUL PARTICIPATION

- Seventy percent of household must fill out and sign the individual agreement supporting the terms and conditions before the project is approved.
- Water group plans the execution of the project involving all households.
- Members of the Water Board serves a three-year term and could be re-appointed.

ACCOUNTABILITY

- Each system has trained Water Board members.
- Water Board must present updates to the community on the operation and management of the system.
- Water Board must provide monthly financial statement to the relevant Ministry.
- Each system should be audited annually by Government Auditors.

IMPACT

- The water aspect has worked very well as the goal of meeting 100% coverage by the year 2015 is realistic. Approximately 95% coverage to date with 100% coverage in the Urban Areas.
- Sanitation was never a priority and when the Rural Water Supply and Sanitation Program was terminated in December 1995 that is where it stopped.

SUSTAINABILITY

- Times change and people must accept these changes to progress.
- Systems have failed because of poor management and no guidance.
- Moving from the “flat rate” to “metering” has been difficult but is a necessary good especially when it comes to water conservation.

FRESH WATER AVAILABILITY

- Availability: APPROXIMATELY 54,000 cubic meters per person per year.
- Annual renewable: 16.0 cubic kilometers (16,000,000,000 cubic meters) per year.
- Total withdrawal: 0.02 cubic kilometers (20,000,000 cubic meters) per year.
- Withdrawal per capita: 83 cubic meters per person per year.

AVAILABILITY (cont.)

- Belize Water Services Limited (B.W.S.L) produced 2,679 million US gallons water for the 2009 – 2010 fiscal year.
- No monitoring is done on the Rural Water Systems nor private water systems.

WAY FORWARD

- Development of a comprehensive plan for SANITATION with the Water Component attached.
- Take into consideration all ten criteria.
- Consider the political leaders and their concept of sanitation.
- Most importantly, a dedicated health education program that portrays sustainability.

INCREASED PRODUCTIVITY THROUGH

- THANK YOU