The vital word in Saint Thomas and Saint John is water. Because of the lack of it in the past, the population remained low. With new desalinization techniques, the islands can support both a greater local as well as tourist population.

The basic problem stems from the fact that the islands are volcanic in structure (Figure one) without water storage pockets. Also, there are no fresh water rivers. The populace has had to depend on a cistern method of gathering rainwater, but this method was only fairly dependable as sometimes it rains for days straight, and other times it does not rain for several months in a row.

The biggest problem is the inability to store all the water let loose during a rainy period which could otherwise be useful during those times it is dry. This problem is also prevalent with the desalinated water storage, but that will be taken up later.

The majority of the populace of approximately fifteen hundred on Saint John lives in either Cruz, Caneel, or Cinnamon Bays, all of which lie on the north and west sides of the island.

There is at Cinnamon Bay a tenting resort located within the national park limits (which cover most of the island), with twelve cottage units as well. The camp water supply consists of rain runoff from the roofs of both the commissary and the storage shed. This is supplemented by "wells" of fresh water.
which floats on the sea water, and by a ten thousand gallon capacity catchment basin which is supplied by rain runoff from the mountain to the rear of the camp. Also, ten thousand gallons per week of desalinated water is brought in by tank ships from Saint Thomas. Each two cottage units shares a cistern which is supplied by rain runoff from their roofs.

At Caneel Bay is located a large luxury resort, the profits of which were turned over to the national park system, but now is owned by Eastern Airlines. Here, a million gallons per week of desalinated water are brought in from Puerto Rico. This water is used for prime cleanliness purposes such as drinking water and for bathing and washing dishes. The used water goes to a separation pond where the fresh water tends to float on the polluted water, and is then skimmed off and used for toilet facilities. The used water from here in turn is sent to the private sewage treatment plant of Caneel Bay. The cleaned water from that process is re-used and the rest goes to the separation pond.

Cruz Bay is the main harbor of the island. Most of the home population lives here. It is the main market area where one can purchase fresh fruit and fish on the dock as it comes in from Saint Thomas and Puerto Rico on the ferry. There is one small public catchment basin with about a one thousand gallon capacity which services the school. The homes, however, have to use the old cistern method of rain runoff (Figure two) from a corrugated tin roof into a drain pipe and then into an open rainbarrel. The people supplement this with bottled water from Saint Thomas. The newer homes have a more sanitary method which will be seen in Saint Thomas.

The cistern method of catchment is not very sanitary, and unless one is accustomed to drinking this water, one should boil it prior to consumption.

Saint Thomas differs vastly from Saint John in that it is a much larger island, and has a magnificent, large harbor which has been used for centuries. It is located at the free port of Charlotte-Amalie which makes it even more popular for tourism. The population of Saint Thomas presently is about twenty thousand, the majority of which is located in Charlotte-Amalie.

Because of this great difference in population (home and tourist besides) the water needs of Saint Thomas are much greater than those of Saint John. There are several public catchment basins (Figures three and four), and each home has its own cistern, either of the modern type (Figure five) or the kind seen in Saint John.

Supplementing these is the complex of desalinization plants. (Figure six). These are located in Little Crum Bay in Charlotte-Amalie and are supplied by the water in the bay. The three different plants are: a two hundred seventy-five thousand gallons per day capacity plant manufactured by Aquachem, Incorporated, of Waukesha, Wisconsin, which was the first plant in all of the Caribbean, and was installed in 1962; a one million gallons per day capacity plant made by Westinghouse Electric Corporation which was installed in 1967, and a two million five hundred thousand gallons per day capacity plant by Baldwin-Lima-Hamilton Corporation of Philadelphia which was installed in 1968. They all work on the same basic multi-stage flash evaporator method of desalinization, and together can produce about four hundred million gallons per day.

This flash evaporation method is "a process in which water is evaporated under vacuum. Boiling temperatures of the water under vacuum are considerably lower than normal. When hot water at a temperature between 170
Figure 1. Example of volcanic structure of the Virgin Islands. This is a view of the southern coast of Saint John.
Figure 2. Typical house types in Cruz Bay, Saint John, with the old system of cistern catchment of rainwater.
Figure 3. View of an older mountain catchment system for the public as seen from Crown Mountain, the highest point on the island of Saint Thomas.
Figure 4. View of newer public catchment basin which can be seen from the airport of Saint Thomas.
Figure 5. Typical housing for the College of the Virgin Islands showing the more modern method of rainfall catchment for personal use, as seen on Saint Thomas.
Figure 6. Example of the severe pollution resulting from the firing of furnaces at the desalination plants on Saint Thomas.
Figure 7. View of direct pipelines which the homes of Saint John use to pump raw sewage in the Caribbean and Atlantic.
and 195 degrees Fahrenheit is injected into a vacuum chamber, some of the water will instantly flash into vapor. The remaining brine then flows to a succeeding higher vacuum chamber where further flashing takes place. It should be noted that boiling does not take place on heat transfer surfaces, an important factor in scale control (salt build-up in the tubes). The seawater which initially serves as a coolant, flows through the condenser tubes on which the vapor condenses to distillate.” (From Unlimited Fresh Water; Aqua-Chem, Inc.; Waukesha, Wisconsin; 1966; page four.)

As the water usage on Saint Thomas is only about one million five hundred thousand gallons per day, there is an excess created which is stored in two large ten million gallon capacity storage tanks. The plants produce water of ten parts per million total dissolved solids. (The acceptable limitation for consumption for the United States is two hundred parts per million.) All plants are dual purpose, extracting steam after it has spent some energy in a turbine which provides power for electric generation for the island. Water produced by this method costs less than a tenth of a cent per gallon. It is distributed throughout the island by pipelines on the surface of the land.

The effects of the lack of water in the past and the abundance of water now are numerous. In 1950, the population of Saint Thomas was about thirteen thousand eight hundred and for Saint John was seven hundred fifty; the 1960 figures for Saint Thomas are sixteen thousand two hundred and for Saint John are nine hundred; today, they are twenty thousand and fifteen hundred respectively.

Because of the lack of water in the past, the residents ran their sewage raw into the bays. (Figure seven). This was of little consequence twenty years ago, but today, with the vast amounts of pollution from the ever-growing population, public sewage systems are mandatory for the well-being of both islands.

With the advent of the desalination plants, enough water became available so that tourism expanded. At present, almost the whole residential populace of both islands depends on tourism, either directly or indirectly, for its livelihood.

On Saint Thomas, with the large population as well as the availability of water, moves are being made toward expanding industry on the island. The present industry consists of bayrum production and aspects related to road-building and construction of all kinds.

As Saint Thomas and Saint John begin to boom, man has begun to destroy another area of natural beauty.

References

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