

**The production of cementitious materials from seawater to supplement building requirements in the Caribbean.  
GREEN ECONOMY**

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**Abstract**

The creation of construction material is an expensive process in the Caribbean and requires significant space, mined resources and energy. Many of the materials required in the cement production is mined or imported. The manufacturing of cement is associated with several environmental problems including intensive energy utilization, environmental degradation due to mining and significant carbon dioxide emissions. The traditional production methods involve the use of rotary kiln and the consumption of large amounts of fuel, which results in a large volume of carbon dioxide gas being vented into the atmosphere.

Many Caribbean countries require desalination to supplement their current water requirements. The waste streams generated as a result of desalination can be utilized to extract the minerals from the concentrated mixture. The process involves the selective precipitation of calcium and magnesium salts from seawater by passing carbon dioxide vent gas through the concentrated seawater. The waste streams are rich in valuable minerals that are used in the production of cement and many other compounds including deicing agents, potable water, hydrogen, chlorine, hydrochloric acid, sodium hydroxide and sodium hypochlorite.

The greatest savings can be achieved in improved energy efficiency due to the reduction in the transportation and mining costs. The generation of new products can also be used to offset the intense capital investment that is required. There are added advantages as a lower raw material in the form of limestone requirement; resulting in lesser environmental degradation.

A case study was performed on the island of Trinidad using their current infrastructure and it was estimated that this process could reduce the amount of mined material by 33% while simultaneously reducing its carbon footprint and has the potential to sequester significant volumes of carbon dioxide.

Keywords: Cement, Seawater, Carbon Sequestration.