

KNOWLEDGE SHEET 7

Best Practices Playbook: Shifting away from Sand Mining in West Africa

The effects of climate change—from changing precipitation patterns to rising seas—will exacerbate the coastal erosion already affecting West Africa, increasing the exposure and vulnerability of the people and assets located there. Given the importance of the coastal zone to the region as a whole, it is critical that policymakers consider the effects of future climate change in the decisions they make today.

On some island and coastal beaches of West Africa, large dump trucks, or even horses with carts, approach in the early morning light. All arrive with the same aim: To take as much sand as their vehicles will hold, heaving dune-sized scoops of beach away from the coast day after day, decimating lagoons and exacerbating coastal erosion.

Sand is created on land and at sea by break down of rocks, corals and minerals into smaller grains, but it is being mined much more quickly than it is made. One hundred and fifty countries extracted 3.7 billion tons in 2013, according to the United States Geology Survey. Scientists are concerned that policymakers and the general public are not yet aware of the scars left from the extraction.

Yet West Africa's coastal countries are taking action and raising a unified voice on combating coastal erosion and protecting coastal communities, which are often the poorest and most vulnerable. This approach includes sharing best practices and lessons learned from critical environmental crises such as sand mining. The World Bank West Africa Coastal Area (WACA) management program, a platform where technical and financial partners support sustainable development in the coastal zone, is a partner in these efforts.

São Tomé and Príncipe may be one of the smallest island countries off the coast of Africa, a destination for eco tourists, bird watchers, amateur historians and beach combers.



Basalt Rock Crushing in Mauritius

The beaches, however, are a great natural resource in peril.

The problem of sand mining has become so endemic that military police have intervened in recent months to help enforce the recent ban on the practice along the severely eroded coast. The government is all too aware of the next, difficult step: To create alternative livelihoods for informal sand workers and find new materials for the construction boom.

Solutions

In the fall of 2016, a representative of São Tomé and Príncipe visited the island of Mauritius. He had something specific he wanted to learn: How does a small island state shift from sand mining, an estimated \$70 billion global business, much of it underground? And what does the construction industry use in place of that sand?

São Tomé, like Mauritius, is made of volcanic rock islands. Government officials are investigating whether informal workers can be enticed away from the sand business and whether his country could replace coral sand with sand made out of basalt rocks for the purposes of building

and infrastructure. In fact small private enterprises have started crushing basalt rock in São Tomé, but it is relatively small in scale.

Sand and gravel are mined worldwide and “account for the largest volume of material extracted from the earth,” according to the United Nations Environment Program. The amount of sand disappearing has a profound impact on how coastal areas are able to deal with the effects of climate change and natural disasters, disturbing the beach profile equilibrium, with consequences on the natural protection roles of beaches to dissipate wave energy and to block inundation.

The Mauritius Playbook

By the end of the 1980s, the island nation of Mauritius felt the brutal effects of sand mining. Its lagoons were depleted and the impact—dead corals, dying seagrass, heightened erosion and weakened ecosystems—was visible enough for the government to hire scientists to study the issue.

It was clear that the sand quarries on the beach were leading to irreversible damage to the island. Between 1996 and 2001, the practice was phased out, and banned. The banning of sand mining, however, was done after the transition from beach sand to rock sand.

Crushing Basalt Rock

The isolated and bumpy road to the rock quarry in northern Mauritius is long and the dust is ubiquitous, like chalk in your mouth. No one is allowed to live within one square mile of the Basalt Rock plant, to protect people against the air pollution caused by volcanic basalt rock sliced out of hillsides and devoured by crushers and mixers.

Some of the local workers have been mixing concrete on Mauritius for more than 30 years, and were there for the change from beach sand to basalt rock sand. One engineer, who did not want to be named, sits in his control room in an orange vest and beige work shirt. “The transition from sand to rock was not an easy one,” he recalled. “It took about four years for us to be able to mix the rock sand to a consistency that worked for cement. But once we got the consistency, it was no longer difficult.”

The overall ban on sand mining in Mauritius has been in place for 15 years. The government paid compensation to those who worked as sand miners, and some of them bought boats for tourism. Following the ban, the Ministry of Environment and Ministry of Fisheries monitored the former beach sand mining sites for several years, and found new sea grass cover and new coral colonies.

The sand (or mostly pebbles) obtained from the rocks are even now used to replenish the depleted beaches, such as in Grand Sable, with support from Japan International Cooperation Agency (JICA), as an attempt to correct past mistakes. Gravel will even stay longer and therefore reduce the erosion rate, without preventing the use of the beaches for fisheries and touristic activities.

The West Africa Coastal Areas Management Program (WACA) is a convening platform that aims to assist West African countries to sustainably manage their coastal areas and enhance socio-economic resilience to the effects of climate change. The program also seeks to facilitate access to technical expertise and financial resources for participating countries.



West Africa Coastal Areas
Management Program

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