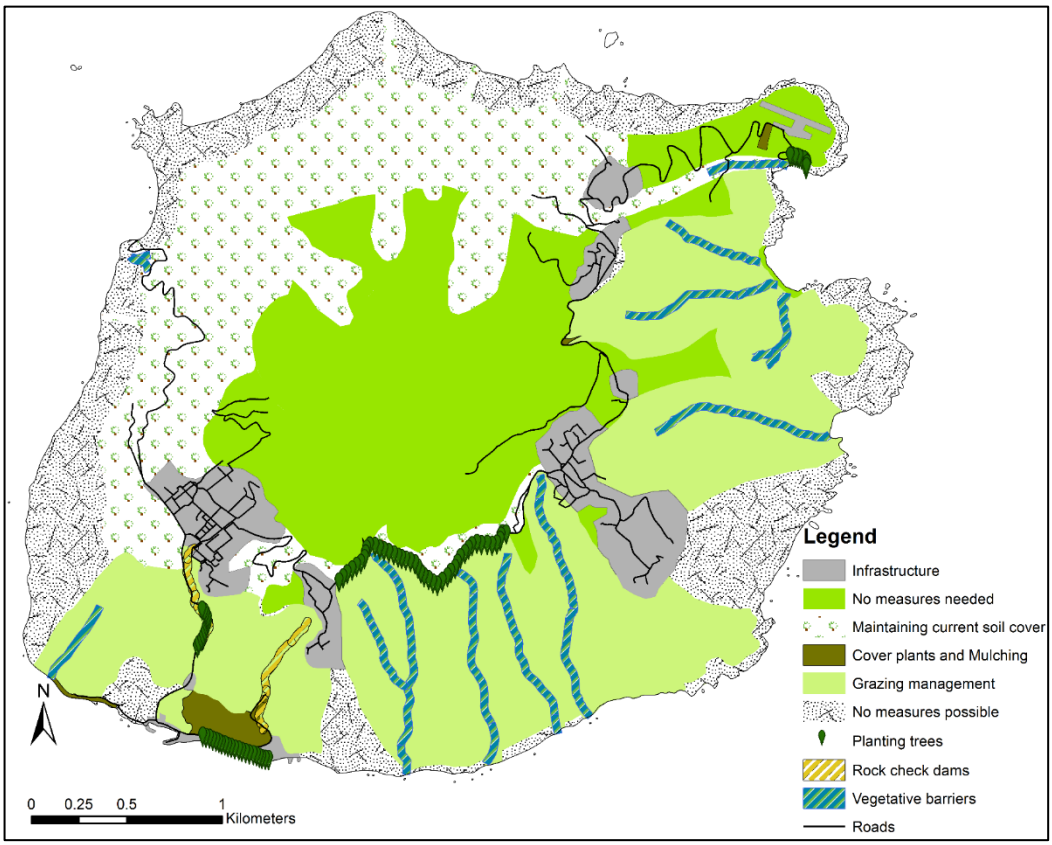
Soil erosion and prevention on Saba: Recommendations



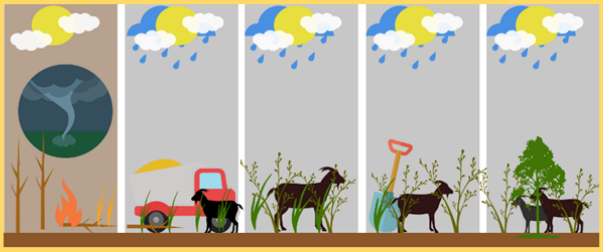
Based on the interviews conducted, the erosion awareness questionnaire, field trips and literature research, the following measures are found to be suitable and recommended for Saba:

- Awareness raising on the erosion causes and problems is needed (*for example see infographic next page*). Communal tree planting will involve the people that are aware and will assure the needed manpower. Nature education at school (e.g. geography class), by Junior Rangers and Snorkel club programs, by Child Focus and by Sea & Learn should be encouraged to involve younger generations in future nature conservation.
- Maintain current forest areas to assure soil cover for the future, especially close to vulnerable areas and buildings. Oblige minimal disturbance of the soil cover in new construction projects
- Avoid concentrated outflow of water from the roads, gradually diverting the water leads to less erosion. This is especially needed for the water going from the Level to Booby Hill and at the lowest points of The Road.
- Reduce grazing pressure to assure natural regrowth of vegetation, which is well adapted to local conditions and more biodiverse than technical restoration.
- Reducing grazing pressure to 0.1 goat per hectare is expected to be difficult to maintain on Saba. It is therefore recommended to help goat owners to fence all of their goats and to use off-island hunters for the final eradication of the free roaming ones. Small fenced areas can be used as an example for goat owners.
- With good grazing management, tree planting is only necessary at high risk areas. This is around Cove Bay, along the road between St Johns and Windwardside, along the Fort Bay road and along the road to the landfill. Fruit and nut trees can contribute to local food production.
- Rock check dams will slow down the water and catch the sediment in gullies accessible by machinery. This is needed in the gut next to the Fort Bay road and the gully from St Johns to the landfill. Rocks are locally available and otherwise used car tires filled with cement can be used. Grass barriers will enforce the dams and help catch finer sediment.
- Vegetative barriers are needed in gullies inaccessible by machinery, the Tent Bay gut and the Cove Bay gut have priority given their marine and recreational value respectively. Local grass species are suitable and vetiver grass can be a good addition, since this species is non-invasive, very strong and grows in Saba's climate.
- Grass barriers should be used to strengthen hiking trails, especially right after maintenance when the soil cover is disturbed.
- Grass cover is needed for the dumpsites in the Spring Bay gut, on the Tent Bay road, around the stone quarry and on future construction sites. Organic material should be used for mulching, shredded trees add nutrients to the soil for fast regrowth of vegetation and intercept the rain, thereby avoiding splash erosion.

Soil erosion and prevention on Saba

Erosion is the natural transport of rock, sand and clay. Enhanced erosion, by human intervention, is something we need to prevent.

Naturally, vegetation would re grow after a drought, forest fire or hurricane, thereby protecting the soil from eroding away.

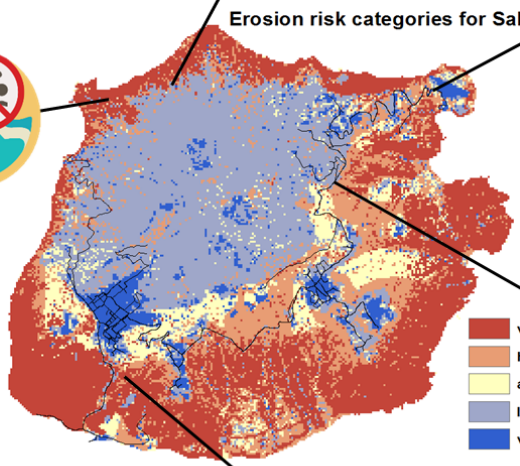


Due to overgrazing by goats and changes in soil cover by humans, this is not happening everywhere on Saba.

Erosion in the form of landslides and rock fall leads to damage and dangerous situations on **hiking trails.**

Archaeological sites get filled up by sediment like the indigo vats at Cove Bay or are washed away like some houses at Mary's Point

Erosion risk categories for Saba



Rock fall damages **beaches** and causes dangerous situations like at Well's Bay

Loose material on **dump or construction sites** gets easily removed by rain and washes away. This is happening in the Spring Bay gut and at the landfill

All eroded material eventually reaches the ocean. When this is too much, this causes damage to **coral reefs** and poor visibility for divers

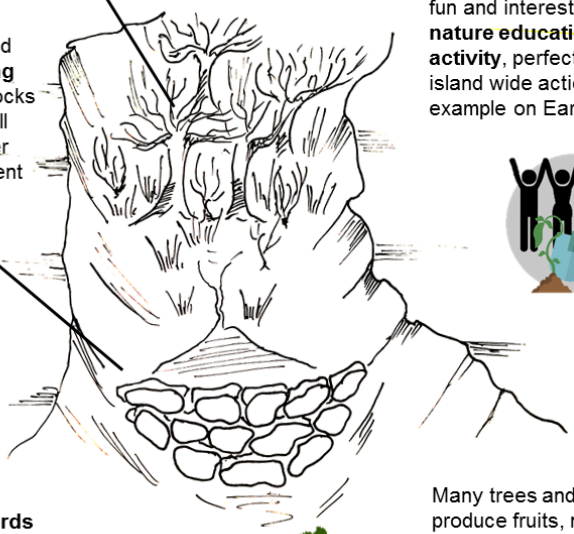
Heavy rainfall leads to excessive water on the **roads** and rock fall leads to damage and blocking, for example at the Fort Bay road

The nature of Saba and its dive sites and hiking trails are the main reason for visitors to come to the island. Erosion will thus indirectly affect the island's economy.

Planting trees, shrubs and grasses is the most effective and most beautiful option for places where erosion is a problem. The plant's leaves intercept the raindrops and the roots hold the soil.

Planting trees can be a fun and interesting **nature education activity**, perfect for an island wide action. For example on Earth Day

When erosion prevention is needed immediately, **placing dams** made from rocks or used car tyres will slow down the water and hold the sediment



Smaller and better **managed goat herds** help vegetation to regrow naturally and secured fodder availability will lead to larger goats and higher meat quality

Many trees and shrubs produce fruits, nuts or edible leaves too. This increases **local food production** and is beneficial for many types of birds and insects.

Erosion preventive measures like planting trees, combined with nature education will conserve Saba's beautiful nature for the future, both on land and in the water. Increased production of fruits and nuts, together with higher quality goat meat will decrease the dependency on food import.

Want to help?

Follow the SCF facebook page *(@sabapark)* for updates on activities or reach out to the Agriculture Department for the purchase of plants

Designed by Jesse Opdam as part of his master's thesis for the International Land and Water management program of Wageningen University, the Netherlands. *December 2017*
The erosion risk map was made by Pim Arendsen (2017) and the preventive measures are adapted from Morgan (2005) and El-Swaify et. al (1982)

- Arendsen, Pim. (2017). Mapping erosion on Saba: How to keep the Unspoiled Queen from tumbling down. (Bachelor's thesis)
- El-Swaify, Samir Aly, Edgar W. Dangler, and Clinton L. Armstrong. "Soil erosion by water in the tropics." (1982).
- Morgan, R. P. C. (2009). Soil erosion and conservation. John Wiley & Sons.

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