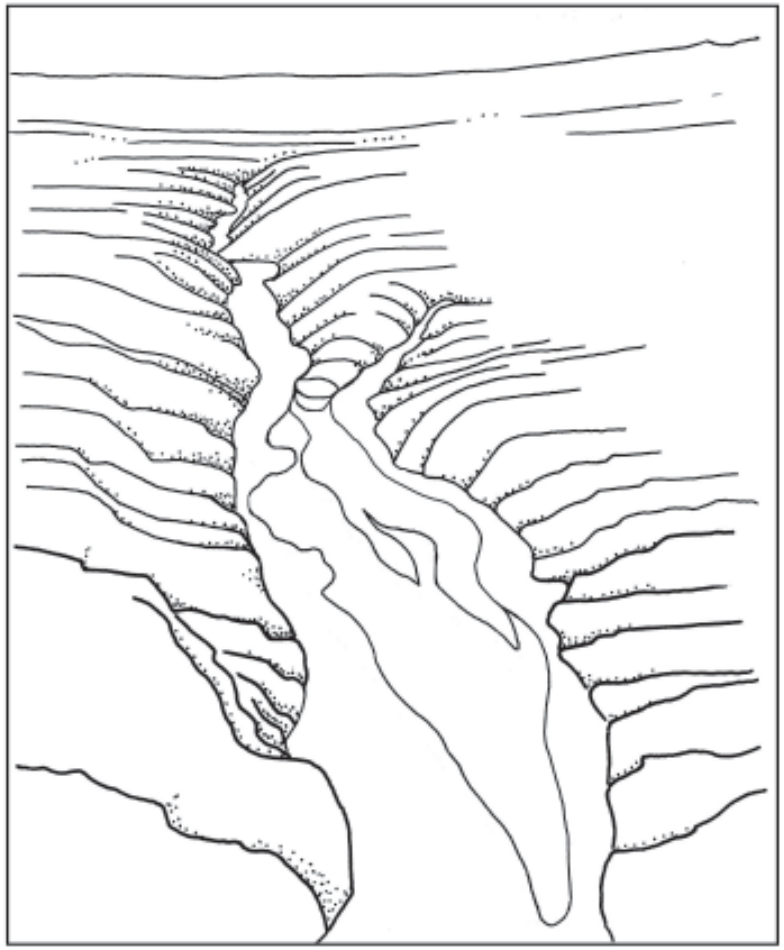
Protecting Soil on Pacific Island Farms



What is soil erosion?

Soil erosion is the breaking apart, dissolving, wearing down, and moving of rock and soil. It is caused by water, wind, animals and humans, and gravity. Some erosion is natural, but poor farming practices, over-grazing and improper tree harvesting can greatly speed it up and cause damage to the land.

Erosion can be a problem on your farm because it:

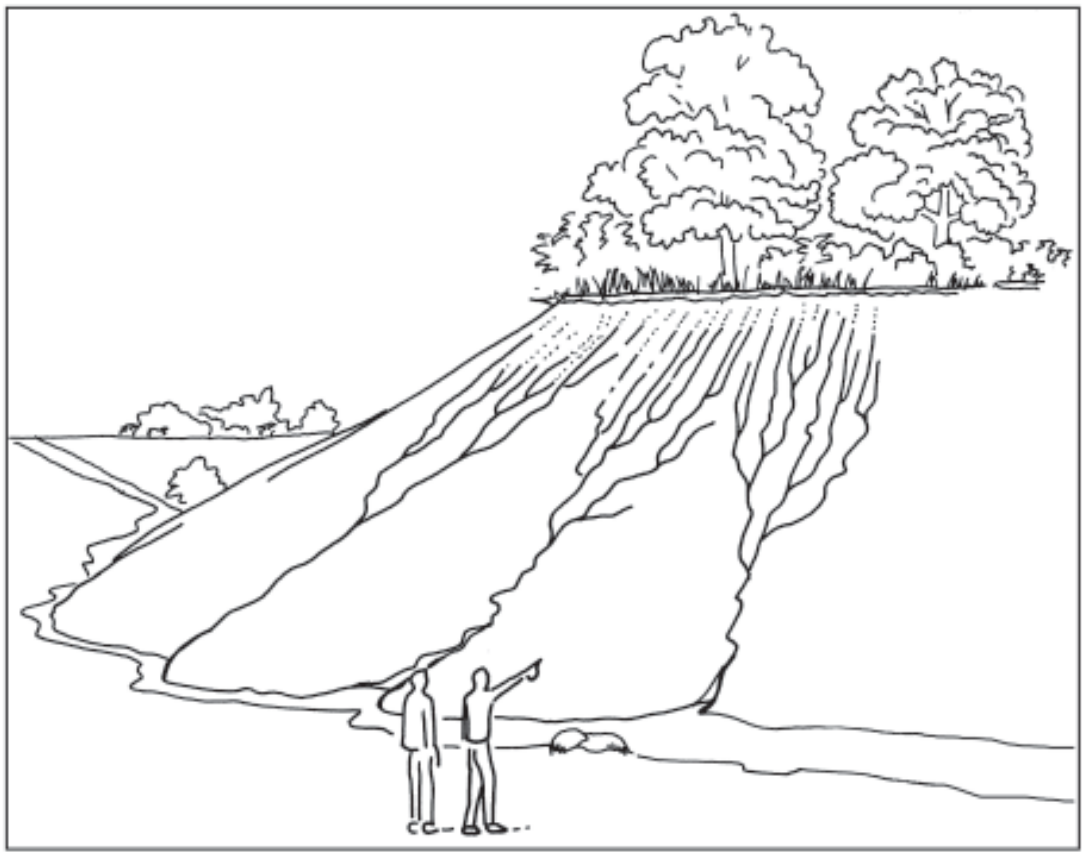
- washes away valuable topsoil, making your fields less fertile.
- may wash away large sections of stream bank.
- can clog up streams and rivers causing flooding problems on-farm and downstream. Dirt settling on coral can kill reefs, damaging island fishing areas.
- may wash away pesticides and nutrients, causing water pollution that is harmful to fish and other water creatures.

What does erosion look like?

1. **Raindrop or "splash" erosion**: Falling raindrops hit bare soil with a lot of power, moving soil particles up to 5 feet (2 meters) away. Larger drops from tropical rainstorms and typhoons have even more power. Once soil is detached, flowing water can move it easily.

2. **Sheet and rill erosion**: As rain collects, a thin film or sheet of water moves across the surface of the ground, removing a thin layer of soil in bare soil areas. Moving water collects into small little channels (called rills) or larger channels (called gullies), cutting even more deeply into the soil surface. Rills usually cut down only a few inches.

3. **Gully erosion**: Gullies can be many feet deep and cause much damage to a farm field. Once water concentrates into channels, it has the power to move very large amounts of valuable soil. A field badly eroded by water will have thinner, less fertile soil and gullies that equipment cannot cross.



4. **Stream and channel erosion**: Streams and rivers carry larger amounts of water at higher speeds. Huge sections of stream or riverbank can be torn away during big storms.

How should Pacific Island farmers control erosion?

You cannot control some things in nature, like climate or soil type. But you can control other things like plant cover and slope length by using the conservation practices explained below.

Soil

You can manage your topsoil to slow down erosion. By adding organic matter to your soil (as a mulch, compost, green manure, or cover crop) you can enrich and loosen up the soil, getting more water to filter down into the ground.

Consider using the following practices to help improve soil health and increase water held in the soil for crops.

❑ Cover Crops (340) or Conservation Covers (327)

❑ Tree/Shrub Establishment (612)
❑ Mulching (484)
❑ Residue Management (329)

Plant Cover

To prevent **raindrop erosion**, protect the soil surface year round with a thick cover of living plants or with mulch (chopped leaves, small branches, coconut husks, wood chips, etc.). Plant cover protects the soil surface from the impact of falling rain and slows the speed of rain runoff. Plant roots help loosen the soil and let water soak into the ground. Plant root systems hold soil particles in place.

Consider using the following practices to keep bare soil covered year-round:

❑ Cover Crops (340) or Conservation Covers (327)
❑ Tree/Shrub Establishment (612)
❑ Mulching (484)
❑ Residue Management (329)

Slopes

Slope length, steepness and surface roughness affect erosion. Long, smooth, straight slopes speed up the flowing water.

Water traveling at high speed has lots of power to cut down into the land, making **rill** and **gully erosion**.

Consider using these conservation practices to shorten slope lengths, make them more irregular, and slow down rainwater:

- ❑ Hillside Ditch (423)
- ❑ Contour Farming for Cropland (330)
- ❑ Contour Farming for Orchards (331)
- ❑ Contour Hedgerow Planting (422)
- ❑ Residue Management (329)
- ❑ Vegetative Barrier (601)

Flowing Water

In areas on the land where water runs seasonally or year round (drainage ditches, seasonal and year-round streams), you may need to strengthen the waterway lining to be sure **stream** and **channel erosion** is prevented. USDA NRCS professionals can calculate water volume and velocity and recommend long-lasting channel linings for waterways on your farm. Grassed waterways can usually handle smaller amounts of slow moving water. Stone or concrete linings are

often needed for larger volumes or higher velocities of water.
Consider using these conservation practices for areas with flowing water:
❑ Grassed Waterway (412)
❑ Vegetative Barrier (601)
❑ Channel Bank Vegetation (322)

Animal Management
Grazing animals can cause erosion with their hooves when drinking water from streams. Prevent erosion by fencing them out or by strengthening the watering areas (with assistance from USDA NRCS engineers).

Consider using these conservation practices to help protect stream banks from livestock damage
❑ Fencing (382)
❑ Heavy Use Protection Area (561)
❑ Prescribed Grazing (528)
❑ Watering Facility (614)
❑ Animal Trails and Walkways (575)

Heavy Use Areas
Some areas on the farm get so much heavy traffic and use that they need additional work to help prevent erosion. Part of the solution is to move (or divert) clean water away from these heavily used areas. The second part of the solution is to strengthen these areas (with mulch, gravel, etc.) to protect them from erosion.

Consider using these conservation practices to protect heavy use areas:
❑ Roof Runoff Structure (558)
❑ Heavy Use Area Protection (561)
❑ Access Road (560)

Additional information is available from your local USDA Service Center or at **http://www.nrcs.usda.gov/**

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NRCS Natural Resources Conservation Service