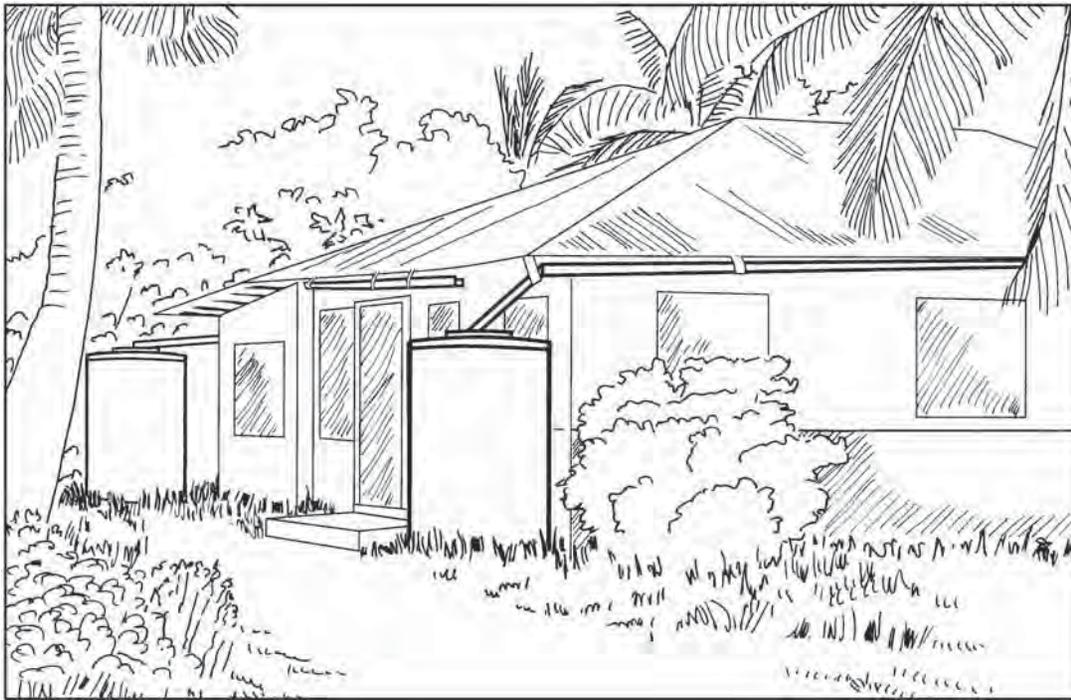


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# Roof Runoff Structures to Improve Farm Drainage

USDA NRCS Practice (558)



*Many flooding, erosion, and pollution problems can be reduced just by keeping roof rainwater away from buildings and other important areas on the farm.*

## What are roof runoff structures?

Roof runoff structures are simple gutters, downspouts, and outlets to collect rain from roofs. During heavy rains, very large amounts of water drain off the roofs of farm houses, barns, and other buildings. Many flooding, erosion, and pollution problems can be reduced just by keeping roof rainwater away from buildings and other important areas on the farm.

## Why install roof runoff structures?

Pacific Island farmers can benefit from installing roof runoff structures on their farm. Use gutters, downspouts and outlets to:

- keep water from ponding or flooding farm buildings.
  - protect farm buildings from undercutting their foundation.
  - prevent rain water from flowing into animal shelters and pens.
  - prevent rain water from flowing into animal waste areas and washing manure into streams.
  - collect roof rainwater for livestock and irrigation use.
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### Plan for roof runoff structures

Here is a chart with some suggestions for materials to use for building gutters. For more information, check with your local USDA NRCS Office.

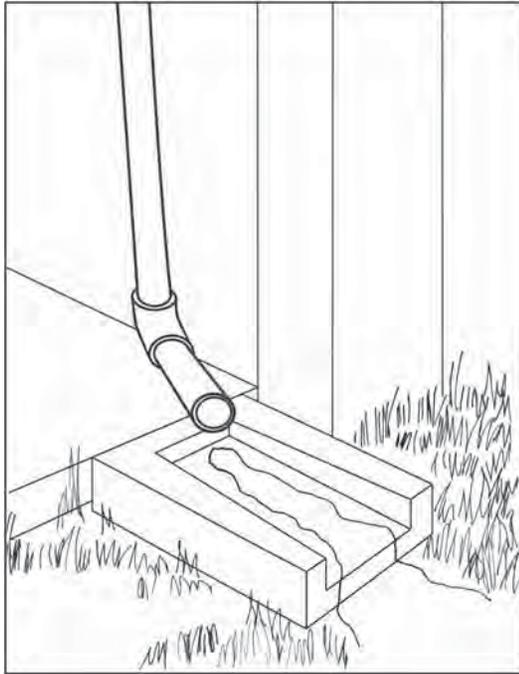
**Downspouts:** Fasten downspouts securely at the top and bottom with intermediate supports 3 meters (10 ft) apart.

**Downspout outlets:** Rainwater concentrates in the gutters and then falls down the downspout. By the time it reaches the ground it has a lot of energy. Protect the ground surface located below the downspout from the water's force by having water fall onto splash blocks, into a surface drain, or into a stable rock outlet. To collect water for livestock or irrigation, place a large container or rain barrel under the downspout.

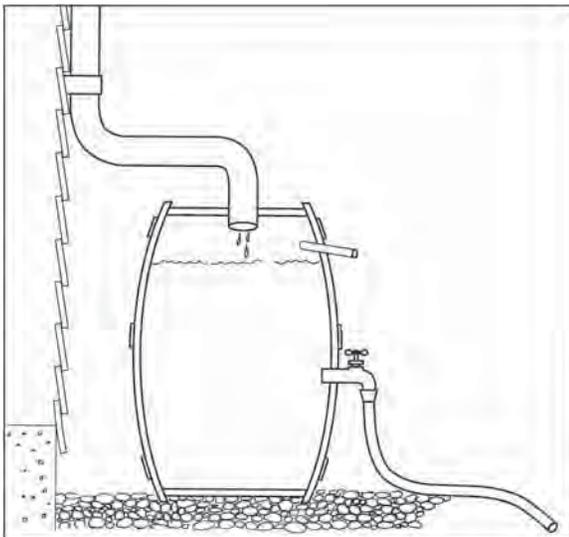
**Direct water away from buildings.** Move the water away from farm buildings in a pipe, grassed waterway or other stable channel. Clean rainwater should **not** be directed toward certain parts of the farm.

Gutters		
Materials for gutters	Description	Spacing for gutter support
Aluminum	0.5–0.7 mm (0.02–0.03 in)	81 cm (32 in)
Galvanized steel	28 gauge	120 cm (48 in)
Wood	free of knots paint with water repellant preservative	81 cm (32 in)
Plastic	with UV stabilizers	81 cm (32 in)





*Protect the ground surface located below the downspout from the water's force by having water fall onto splash blocks, into a surface drain, or into a stable rock outlet.*



*To collect water for livestock or irrigation, place a rain barrel under the downspout.*

Do not drain rainwater into the following areas:

- where your animals are sheltered or penned.
- where there is a lot of manure or stored manure.
- toward your cesspool.
- toward areas with lots of traffic (from people, animals or machinery).
- toward areas where bare soil is already showing an erosion problem.

### **Direct collected water to stable areas.**

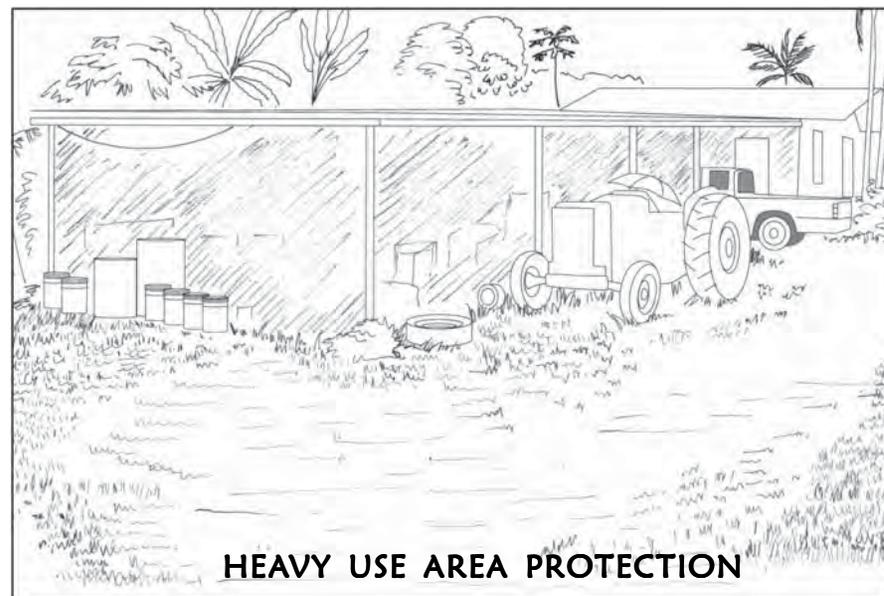
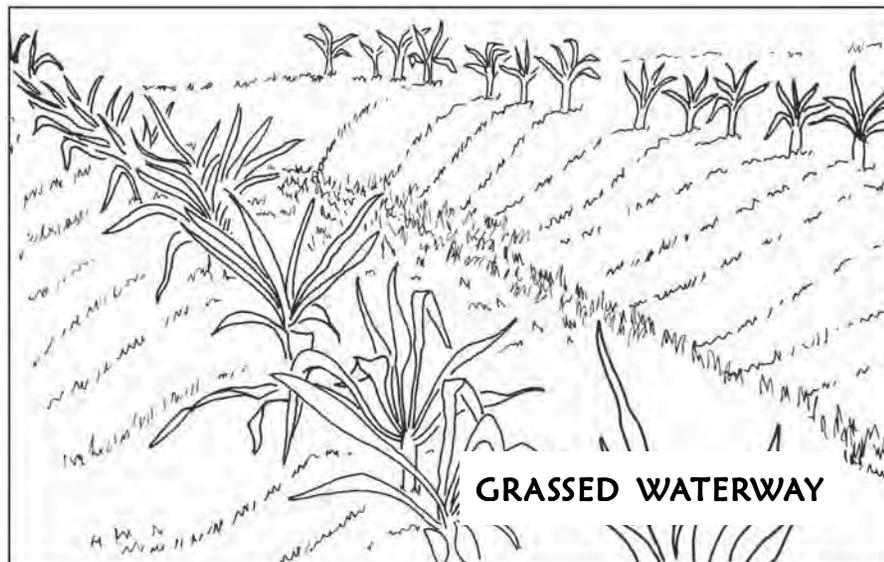
Dump roof runoff water into natural undisturbed areas with thick plant growth. If there is no natural area downhill, grow a strip of plants across the slope. Plant the filter strip with thick grasses or grow a buffer with a combination planting of grasses, shrubs and trees. Some outlet areas may need strengthening with rock or stone.

For assistance to plan, design, or to construct a roof runoff structure, contact your local USDA NRCS field office.

For the best results, combine **roof runoff structures** with other conservation practices:

- **Grassed Waterway** (412): a vegetated channel to carry water without erosion problems
- **Heavy Use Area Protection** (561): reinforcing high traffic areas on the farm

Additional information is available from your local USDA Service Center or at [www.pb.nrcs.usda.gov](http://www.pb.nrcs.usda.gov) and [www.hi.nrcs.usda.gov](http://www.hi.nrcs.usda.gov).



*For the best results combine roof runoff structures other conservation practices such as grassed waterways and heavy use area protection.*



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