



Training on
Roads for Water and Resilience



SPATE IRRIGATION FROM ROAD RUNOFF

IN-SITU STORAGE FOR CROPS

Soil excavated from the trenches is placed uphill (fanya juu) to create terraces, except for the uppermost trench. The floor of trenches are made to slope 3:100 for water to flow away from the roads.

Soil from the uppermost trench is placed downhill to make it into an infiltration trench that protects the other trenches from being damaged by large thunder showers.

Source: asalconsultantsltd@gmail.com



IN-SITU STORAGE FOR WOOD LOTS

Trenches sloping 3:100 divert rainwater runoff from a road onto a woodlot.



After 3 years the trees growing near the trenches are twice as big as those being far from the trenches.

Source: asalconsultantsltd@gmail.com



FLOOD IRRIGATION OF CROPS

Some farmers spent just one hour on digging a 2 m long trench from the side of a road to divert rainwater runoff from the road for flood irrigating their fields.



OTHER TYPES OF IN-SITU STORAGE

Farmers in Somaliland divert runoff from roads onto their sorghum fields by means of a ploughed furrow.



An infiltration trench at the top of a field for two purposes: 1) to harvest runoff from the road in situ for a field, and 2) to protect a field from erosion by runoff from the road.

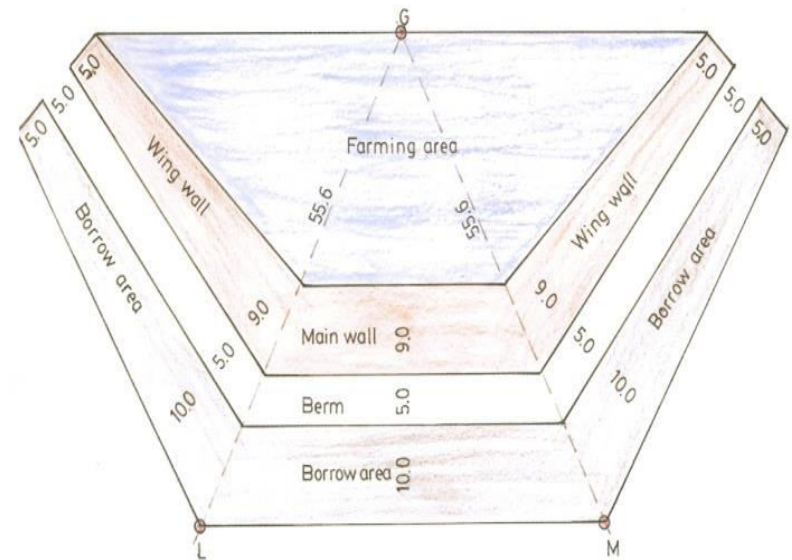


TRAPEZOIDAL SOIL BUNDS

Trapezoidal bunds are used for growing Sorghum, Millet and Water Melons near roads in arid regions

Soil for building the dam walls is taken from borrow pits downhill of a trapezoidal bund.

Source: www.waterforaridland.com

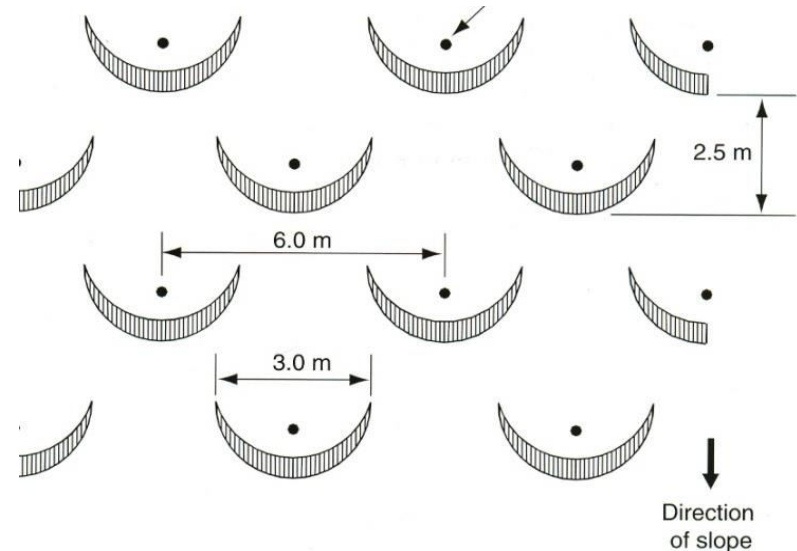


SEMI-CIRCULAR STONE BUNDS

Semi-circular bunds are built of stones packed in soil on downhill sides of roads in arid regions for growing fodder for livestock.

The radius of semi-circular bunds may vary from 3 m to 12 m depending on the slope of the land and availability of stones.

www.waterforaridland.com

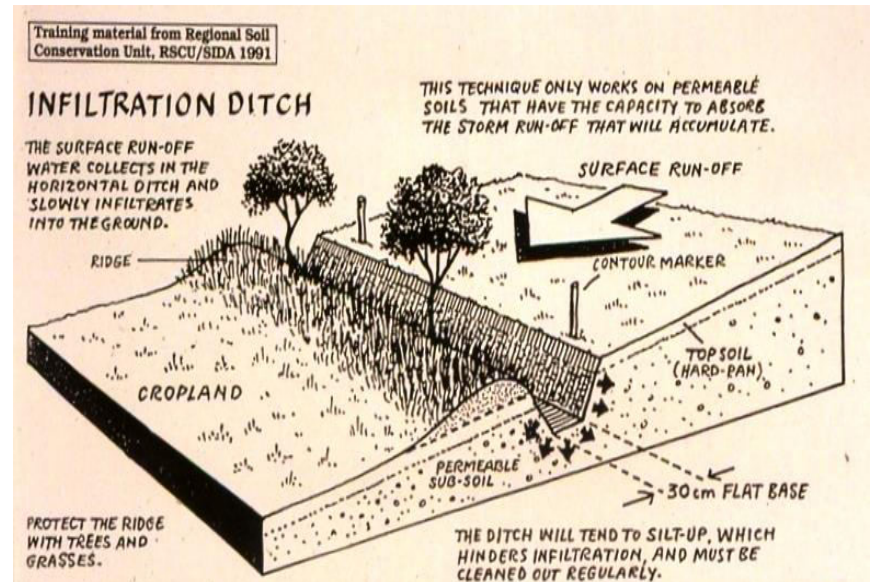


DIVERSION OF ROAD RUNOFF

Diversion ditches are used for transporting runoff water by gravity from roads to fields that are not close to roads.

Diversion ditches are built as the infiltration ditch seen below, except that the floor must slope 3:100 to make water flow by gravity without eroding the diversion ditch.

Source: SIDA Soil & Water Conservation



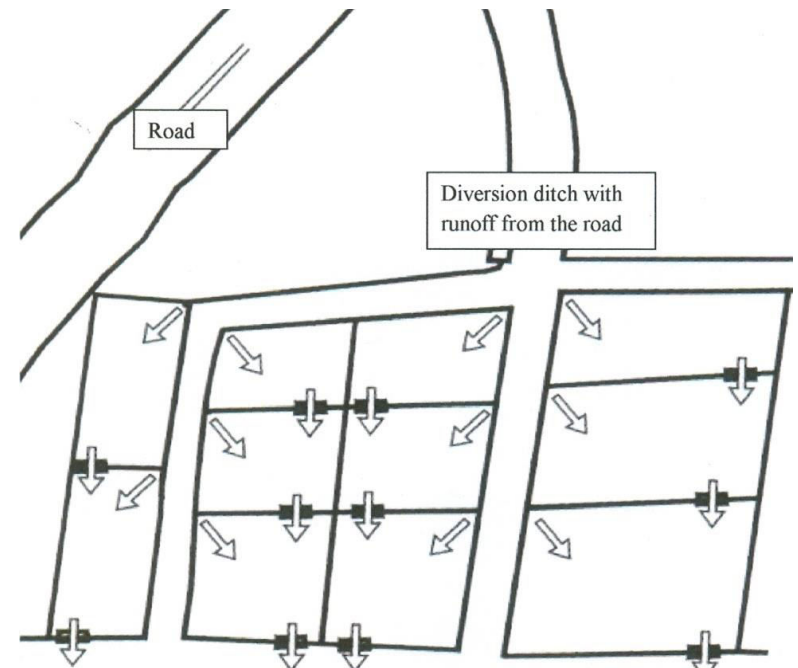
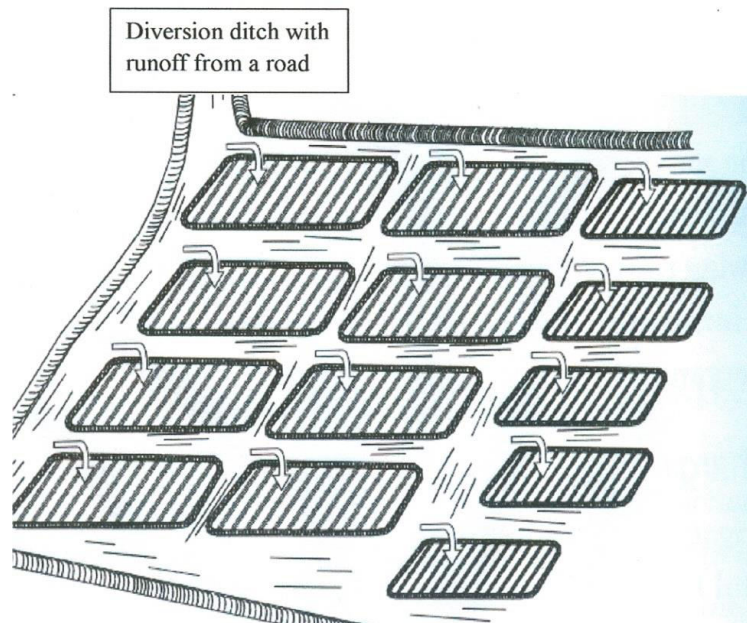
SPATE IRRIGATION OF FIELDS

Runoff water from long sloping roads can be diverted by gravity through diversion ditches to irrigate fields situated at some distance from roads.

Source: RELMA soil & water conservation

The volume of runoff water required for irrigation of relatively large fields depend on the type of crops and climatic season of the year.

Source: RELMA soil & water conservation



AN EXAMPLE OF RUNOFF FARMING

Rainwater runoff from the Nairobi-Mombasa highway creates many gullies on farmland that become deeper for every year that goes by.



A farmer along the highway is utilizing the runoff from a culvert to fill his earth dam with water for livestock and irrigation.



GRAVITY IRRIGATION FROM ROAD RUNOFF

The farmer also diverts some of the runoff from the culvert to a trench with Bananas from where water is gravitated to a lower elevated field with export crops.

When water from the culvert and the Banana trench is insufficient for irrigating the crops, the farmer pumps water from his earth dam which, unfortunately, is situated at an elevation lower than the field.

Source: asalconsultantsltd@gmail.com

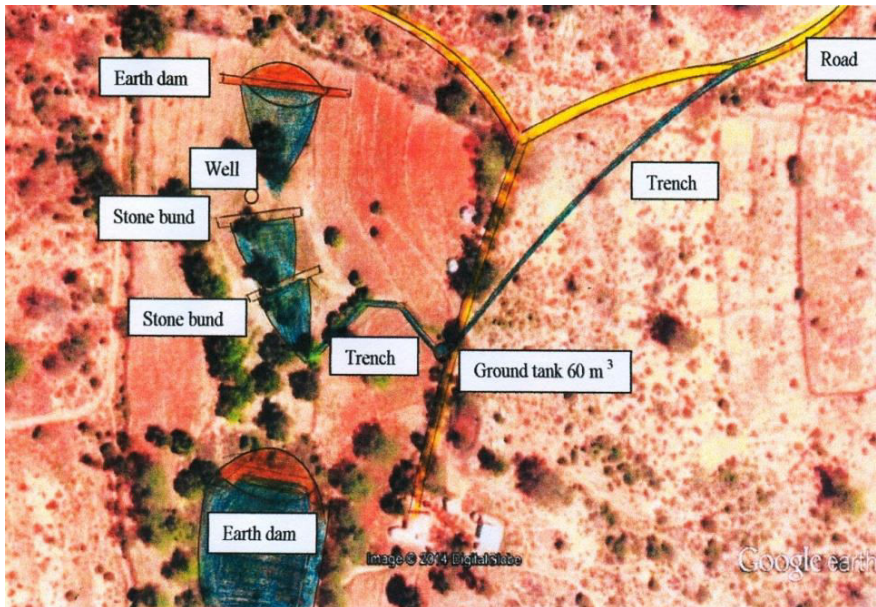


ANOTHER EXAMPLE OF RUNOFF FARMING

10 mm rain on a small dirt road filled a ground tank, a well, 3 small dams with water as well as flood-irrigating 3 acres of orchard in the valley.

Runoff from the road first filled a 60 m³ hemi-spherical tank with water after which the surplus water flowed along a soil/stone bund to the valley.

Source: asalconsultantsltd@gmail.com



REHABILITATION OF GULLIES AT ROADS

Many fields along roads are scared by deep gullies created by uncontrolled runoff, these can be rehabilitated by check dams made of plastic sacks filled with soil. A spillway at each end diverts surplus water to a trench in the field.

After a few rainy seasons the check dam seen on the left photo turned into a small pond with Sugar Cane while Bananas grow using the surplus water in the two trenches.

Source: asalconsultantsltd@gmail.com

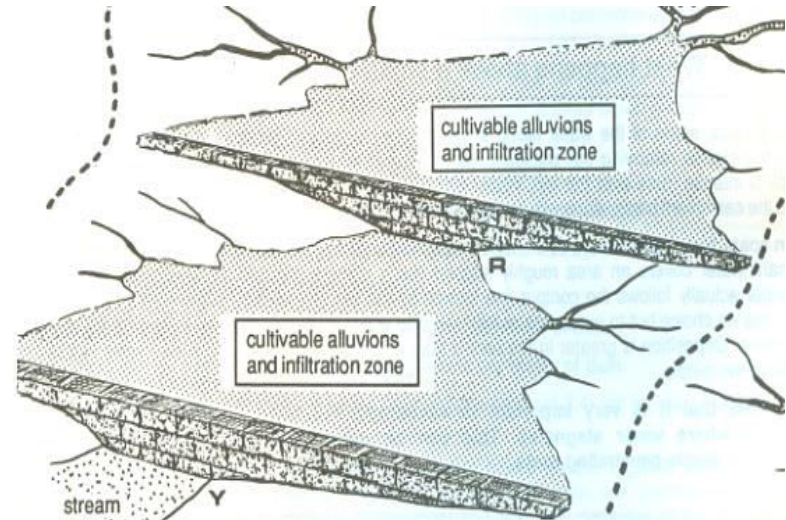


STONE BUNDS IN WIDE GULLIES

Wider gullies and valleys created by road runoff on downhill land can be rehabilitated by a series of check dams.

Check dams can be made cheaply of rubble stones inter-planted with scrubs in lines across valleys and wide gullies.

Source: SIDA soil & water conservation



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