



Effective Water Harvesting and Land Management Techniques Close to Road Bodies

Pictorial Guide for Labour Intensive Programs

Key points

- **Roads have a large effect on water**
- **Water harvesting near roads is very effective as it uses the road as part of the collection of water**
- **This also results in reduced damage to the road and less erosion in the landscape**
- **Many techniques can be done in labour programs**
- **This will create better livelihoods – the increase in income is at least 4-10 times the costs**



Some useful labour intensive techniques that can be used close to roads

1. Water bars and rolling dips
2. Water guiders
3. Infiltration bunds
4. Culvert flood water spreaders
5. Half moons
6. Infiltration trenches
7. Water ponds and recharge ponds

WATER BARS AND ROLLING DIPS TO GUIDE WATER TO THE LAND AND PRESERVE UNPAVED ROADS

1

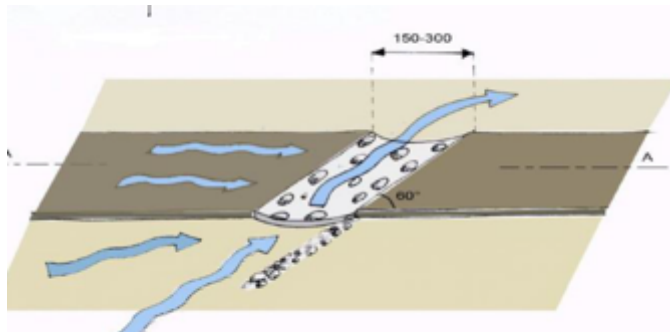
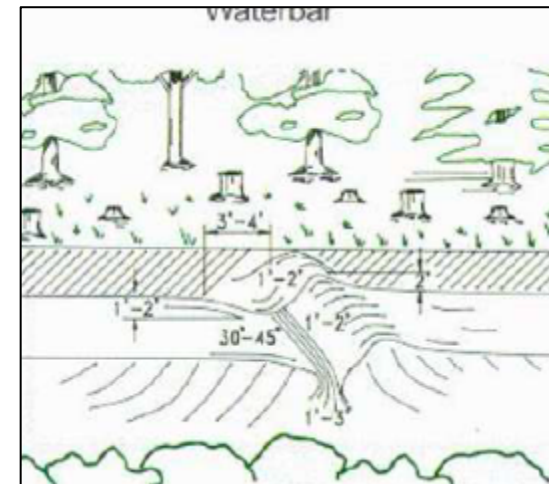
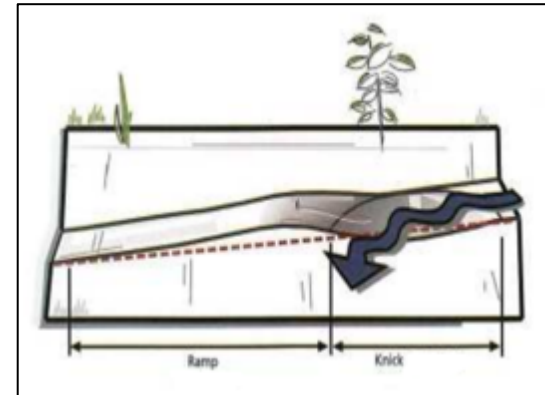
- Water bars and rolling dips are used on unpaved roads to guide water running on the unpaved road surface away to the land
- They prevent rain damage to the road
- They also bring water to farm land or grazing land where good use can be made of it
- They consist of a road bump, very shallow drain in front of it and an outlet to the land
- They are made every 30-100 metres: the steeper the road the closer the distance



WATER BARS AND ROLLING DIPS TO GUIDE WATER TO THE LAND AND PRESERVE UNPAVED ROADS

1

- Use on roads having grades between 3 and 15%
- The road bump is preferably 45-60 cm high
- The bump can be reinforced with stones
- The road bump is placed at 15-30 degree angle with the road
- In front of the bump there is very shallow drain of 90-150 centimetre width
- The drain has a slight down ward slope (4-8 degrees) to flush out sediment
- The drain may be connected with upstream minor stream and be reinforced with stones



ROAD WATER GUIDERS TO TAKE WATER FROM ROAD SURFACE TO FARM LAND

2

Water from surface of paved roads is guided to rain-dependent farm land

The guiders are made at 30-40 meter distance

They are made at an angle with the road and are slightly curved



STONE BUNDS ALONG ROAD TO REDUCE EROSION AND ENHANCE RECHARGE

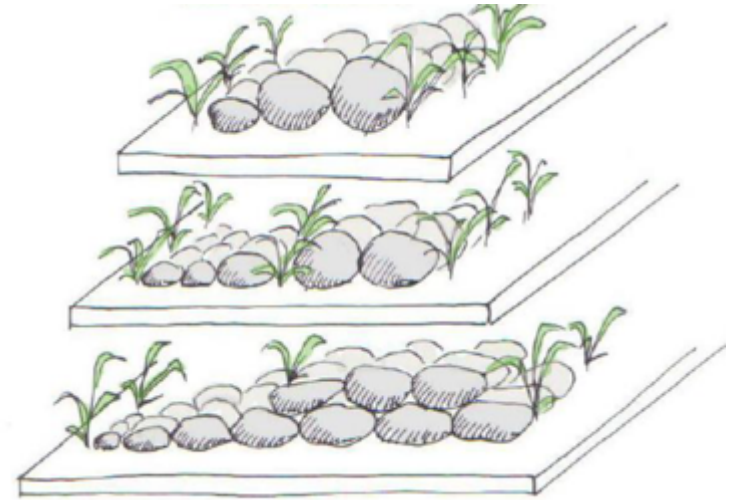
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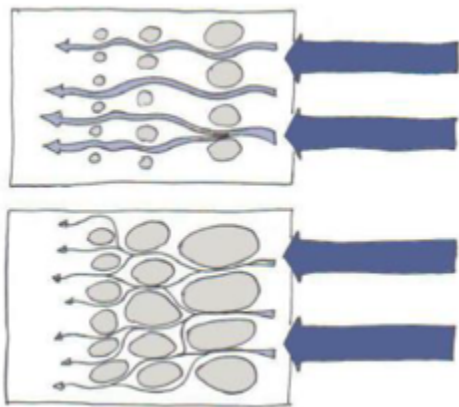
STONE BUNDS ALONG ROAD TO REDUCE EROSION AND ENHANCE RECHARGE

3

- Keep 2-3 meters distance from road
- Ensure bund is 'dense' enough
- If required make the bund wider



Ensure bund is 'dense' enough



Bad

Good !

If required make the bund wider

STONE BUNDS ALONG ROAD TO REDUCE EROSION AND ENHANCE RECHARGE

3

In flat terrain: line shape

In moderate terrain: T-shape

In slopy terrain: V-shape



In moderate terrain: T-shape



In slopy terrain: V-shape



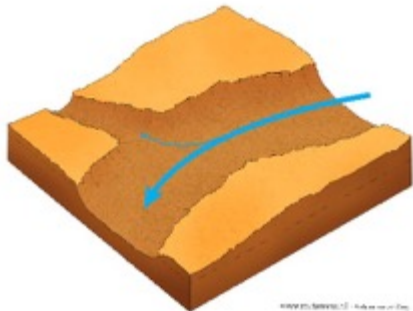
In flat terrain: line shape

CULVERT WATER SPREADER TO GUIDE WATER TO THE LAND AND PREVENT THE DEVELOPMENT OF GULLIES

4

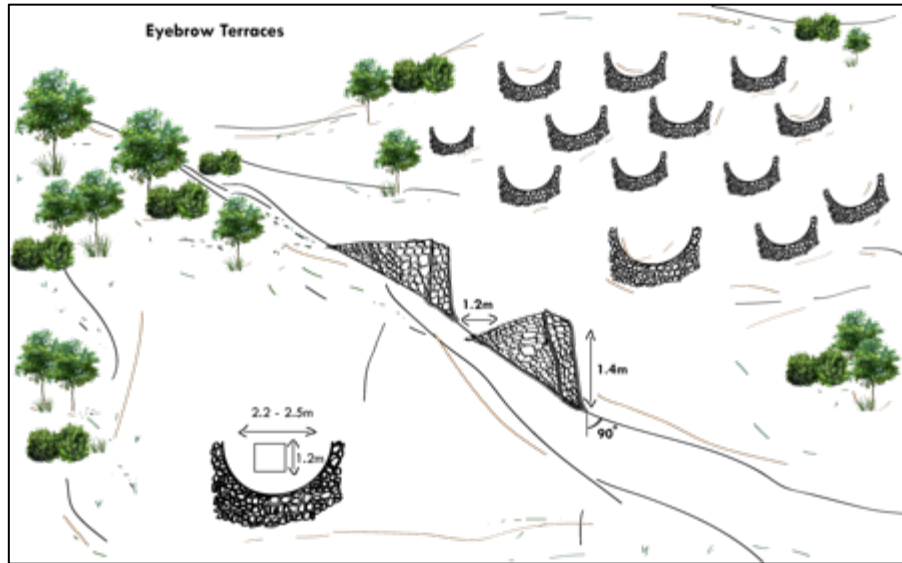
Water from a culvert is channeled into farmlands away from the road and used for farming, groundwater recharge and improving soil moisture)

In steep areas a V-shaped spreader ensures water is guided gently in two direction and and no gully develops



HALF MOONS ON ROADSIDE SLOPES FOR RECHARGE AND SLOPE PROTECTION

5



- Half moons intercepting run-off and sediment - can be used for tree planting
- Large number of half moons on a slope – overflow running from one to the other
- Cross-section and height depending on slope gradient
- On steep slopes 2.2 by 1.5 meter dia and 1.4 meter height

INFILTRATION TRENCHES ON DOWN-SIDE ROADSIDE SLOPES FOR RECHARGE AND SLOPE PROTECTION

6



- If possible series of infiltration trenches to collect run-off
- Water from culverts is led to the trenches
- Each trench is segmented – single trench is 1.5 m length, 0.5 m width and 0.7 m depth
- Optional: bund on downside of the the trench (0.4 m)

ROADSIDE STORAGE AND INFILTRATION PONDS

7



Leading water from roads side drainage and culverts to:

- Converted borrow pits
- Road side storage ponds
- Infiltration ponds and wells
- Natural depressions



We can build back better together

Employment opportunities for rural communities on road construction





The Roads for Water Program is implemented in more than 10 countries

Training material, guidelines, videos and case studies

Are available at:

www.roadswater.org

[Interested, want to integrate in labour intensive program?](#)

www.metameta.nl

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