

Road Water Management for Resilience



Water can be an important cause of damage to roads whereas in turn roads are a major cause for local flooding, compaction and erosion. These problems can be easily turned around into a potential. Roads can route water to storage ponds or recharge areas which help to retain water in dry riverbeds, and ensure systematic spreading of floodwater.

Bringing together agriculture, road and water practitioners, local governments and roadside communities several technologies can be implemented having the following benefits:

- Moisture levels in soils will increase
- Shallow groundwater levels will increase
- Gully expansion will be stopped
- Reduction in flooding of dwelling houses and farmlands
- There will be less damage to roads



Converting borrow pits to store water from roadside drains and culverts

- ✓ Connect culvert to the borrow pit
- ✓ Ensure capacity is adequate
- ✓ Make fence around pond so that no accidents can happen
- ✓ Provide adequate spillway
- ✓ If used for drinking water equip with slow sand filter
- ❗ Make sure the borrow pit is properly modified so there is no danger

Using road crossings to store groundwater upstream

- ✓ Road crossing will help to store water upstream in the river bed which will recharge wells
- ✓ If the river is sandy this can store a good quantity of water
- ✓ If the river is broad a sand dam without culverts will stabilize the river bed
- ✓ If the road crossing is connected to the bed rock it will act as full sand dam
- ❗ Make sure there is a spillway for high floods

Roadside tree planting for environmental mitigation and economic benefit

- ✓ Support local by-laws and planting of economically rewarding trees
- ✓ Select appropriate species together with communities and local experts
- ✓ Involve roadside communities in planting and maintenance
- ❗ Avoid tree planting along curves and road stretches with reduced visibility



Flood water spreaders from road surface to enhance soil moisture and recharge groundwater

- ✓ Make in direction of slope
- ✓ Make at regular distance especially when the road is slopy
- ✓ Avoid use in steep slopes

Roadside pits for soil moisture increase and prevent flooding of farmland

- ✓ Annual maintenance and road side vegetation to avoid siltation
- ✓ Install posts as well as provision of roadside plantations
- ✓ Build a small spillway for excess water
- ⚠ Don't build pits too close to the road

Water spreaders from culverts for supplemental irrigation

- ✓ Use water to spread gently away from natural drain to avoid erosion
- ✓ Construct these culvert water spreaders early on so that no gully will develop
- ✓ Gently guide the water to agricultural land
- ✓ Reinforce the bund with stones when available



Water storage ponds to store water from road side drainages and culverts

- ✓ Include sediment trap and plant vegetation along water flow
- ✓ Lining with clay, geomembrane, or other techniques to avoid excessive seepage
- ✓ Proper water lifting integrated with ponds
- ✓ Make sure capacity is enough to capture the run-off water from culverts
- ✓ If used for drinking water equip with slow sand filter
- ! Do not place too close to road body to avoid road damage



Roadside infiltration ponds for groundwater recharge

- ✓ In areas of high rainfall make the infiltration ponds at angle from the roads
- ✓ Make spill overs between segments of the infiltration pond
- ✓ Remove silt regularly
- ! Avoid infiltration pond too near to the road – may undermine the road and may create road safety problem



Water bars on unpaved roads to avoid flooding of road

- ✓ Make small water bars at unpaved roads at regular distance – this avoids road erosion and helps to harvest water from the roads
- ✓ If the road is steep make these water bars at shorter distance
- ✓ Make water bars at angle with roads to guide the water away from the road
- ✓ Divert the water to land or grazing area
- ! Avoid flooding of adjacent land



USAID
FROM THE AMERICAN PEOPLE



meta
META



This brochure is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of MetaMeta Research and does not necessarily reflect the views of USAID or the United States Government.