



Planting pits and stone lines

Source	WOCAT (World Overview of Conservation Approaches and Technologies) Network
Keywords	Rainfall, runoff water, nutrient availability
Country of first practice	General
ID and publishing year	7516 and 2012
Sustainable Development Goals	No poverty, decent work and economic growth and life on land

Summary

Rehabilitation of degraded land can be achieved through manured planting pits, in combination with contour stone lines. Planting pits are used to prevent water runoff and thereby increase infiltration and reduce erosion.

This method is suitable on soil with low permeability, such as silt and clay, and applicable for semi-arid areas for annual and perennial crops (such as sorghum, maize, sweet potato, bananas, etc.). One main advantage is their simple implementation and maintenance.

Description

The combination of planting pits (tassa) with stone lines is used for the rehabilitation of degraded, crusted land. This technology is mainly applied in semi-arid areas on sandy/loamy plains, often covered with a hard pan, and with slopes below 5 percent.

These denuded plains are brought into crop cultivation by the combination of tassa and stone lines. Planting pits are holes of 20 to 30 cm diameter and 20 to 25 cm depth, spaced about 1 m apart in each direction. The excavated earth is formed into a small ridge downslope of the pit.

Manure is added to each pit, but its availability is sometimes a problem.

At the start of the rainy season, millet or sorghum is sown in these pits. The overall aim of the system is to capture and hold rainfall and runoff, and thereby improve water infiltration, while increasing nutrient availability.

Stone lines are small structures, at most three stones wide and sometimes only one stone high. The distance between the lines is a function of the slope and availability of stone. Typically they are sited 25 to 50 m apart on 2 to 5 percent slopes.

Stones are usually collected from nearby sites though sometimes up to 5 to 10 km away and brought to the fields by donkey carts or lorries (when a project is involved). They are positioned manually, along the contour. Stone lines are intended to slow down runoff. They thereby increase the rate of infiltration, while simultaneously protecting the planting pits from sedimentation.

Often grass establishes between the stones, which helps increase infiltration further and accelerates the accumulation of fertile sediment.

Wind-blown particles may also build up along the stone lines due to a local reduction in wind velocity.



Natural Resources Management

The accumulation of sediment along the stone lines in turn favours water infiltration on the upslope side. This then improves plant growth, which further enhances the effect of the system. Construction does not require heavy machinery (unless the stones need to be brought from afar by lorry).

The technique is therefore favourable to spontaneous adoption. Stone lines may need to be repaired annually, especially if heavy rains have occurred. Manure is placed every second (or third) year into the previously dug pits and sand is removed annually: normally the highest plant production is during the second year after manure application.

Figure 1. planting pits



1. Agro-ecological zones

- Subtropics, warm/mod cool; and
- Subtropics, cool.

2. Related/Associated Technologies

- 7515

3. Objectives fulfilled by the project

- Labor-saving technology (LST); and
- resource use efficiency.