

RAIN WATER HARVESTING FOR CROP PRODUCTION

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Water harvesting is the collection of water which is then used for irrigating crops, pastures, trees and for domestic and livestock consumption. Rainwater harvesting for domestic consumption has been practiced in Kenya for along time. The bimodal nature of rainfall leaves two inter-seasonal dry spells. The reservoirs that collect water, mainly from rooftops are refilled twice per year. In areas where piped water systems are non-functional, dry most of the time or don't exist at all, careful utilization of harvested rainwater has provided clean water to thousands of families in Kenya throughout the year.

However, unlike domestic water needs that require little quantities of water, agriculture is a gigantic consumer of water. This is mainly because crops are grown on open surfaces that provide an expansive surface area for evaporation. On a hot day quantities of water amounting to 80,000 litres can evaporate from 1 ha of land. This figure could get bigger if the land is cored by vegetation and the water is therefore being drawn up from the soil by the roots of the plant and evaporates from the plant leaves. This process, also known as evapotranspiration has to be maintained by ensuring sufficient moisture levels in the soil otherwise the crop will dry up.

Rainfall is the main source of water

for Agriculture. Rainwater provides a cheap (albeit unreliable in most parts) source of water for Agriculture. In the vast majority of land in Kenya amounting to 80%, rainfall is little and unreliable. In some years the number of days receiving rain per season falls short of the planted crops growth duration.

Under the circumstances, the crops dry up before maturity when the rains stop. In other years the rainfall is not continuous and the wet days are separated by dry spells during which crop water needs are not fully met. This results to reduced yields. If the dry spell lasts for too long, the crops might dry resulting to total crop failure.

To supply crops with enough moisture during shortage, rainwater can be harvested and stored, ready for use when the rains subside. In the former case, harvested rainwater will be used to irrigate and the end result is a prolonged growing season. In the later case, the harvested rainwater can be used for irrigation during the intra-seasonal dry spells. This way the crops will have enough moisture during their growing period and the yields realized will be higher than if no irrigation was done. Total crop failure will be prevented.

Rainfall harvesting for Agriculture requires large sized reservoirs. These can be tanks or earth dams. Earth dams can be used for impounding rainwater in form of runoff. Large

runoff quantities are yielded during rains off high intensities. Most of the rainwater goes to waste and harvesting, makes it available when it is needed.

Harvested rainwater in tanks or earth dams can also be used for growing crops during inter-season dry spells if localized irrigation is practiced. Localized irrigation is a method that provides water to the root zone of the plant only. This avoid wastage. It is practiced by drips that release the water to the root zone in small quantities. Vegetables, young tree and fruit plants can benefit a lot from the harvested rainwater.

The soil, which acts as a reservoir can be used for rainwater harvesting. This can be achieved by conditioning the soil to make it more receptive to rainfall. A soil with a high infiltration rate takes up most of the rain water leaving little for runoff losses. This is important for crops because they can then mine the sorted moisture from the soil. To make the soil more receptive to water can be achieved by several practices. They include deep tillage to soften the soil and break the hard pans, use of organic manure which make the soil to be spongy thus holding more water, building terraces to reduce slope thus giving rainwater more time to infiltrate into the soil.