Expansion of cropping in the semi-arid and arid zones of Machakos District is handicapped by soil erosion and the loss of water as run-off. The predominance of annual crops and the system of planting twice a year due to the bimodal rainfall pattern emphasize the importance of terracing for soil and water conservation. Proposals are made for the design of terraces to retain water, and a method is given for calculating the depth of storage required. Terrace banks should be raised periodically to maintain adequate storage capacity which otherwise would be reduced by sedimentation. Provided this is done the land will eventually become benched. Data on minimum infiltration rates are needed to apply the method, and these can be obtained from rainfall simulator studies. The method is likely to be most successful where levelling is done carefully and slopes are less than 15%.ADDITIONAL ABSTRACT:Expansion of cropping in the semi-arid and arid zones of Machakos District is handicapped by soil erosion and the loss of water as runoff. Proposals are made for the design of terraces to retain water and a method is given for calculating the depth of storage required and the extent to which the bank should be raised as sedimentation proceeds. The procedure described eventually leads to the formation of bench terraces and is most successful on slopes of <15%.ADDITIONAL ABSTRACT:Expansion of cropping in the semi-arid and arid zones of Machakos District is handicapped by soil erosion and the loss of water as run-off. The predominance of annual crops and the system of planting twice a year due to the bimodal rainfall pattern emphasize the importance of terracing for soil and water conservation. The paper makes proposals for the design of terraces to retain water and a method is given for calculating the depth of storage required. Terrace banks should be raised periodically to maintain adequate storage capacity which would otherwise be reduced by sedimentation. Provided this is done the land will eventually become benched. Data on minimum infiltration rates are needed to apply the method and can be obtained from rainfall simulator studies. The method is likely to be most successful where levelling is done carefully and slopes are less than 15%.