

Effectiveness of soil conservation strategies on erosion in Morocco

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In Morocco, reducing soil erosion and land degradation is a national priority for improving soil quality and protecting downstream water quality and quantity. The combined use of Cs-137 and Be-7 techniques permit to estimate long and short term erosion and deposition magnitudes under different agro-environment and climatic conditions and then to evaluate the effectiveness of soil conservation practices.

Case studies using Cs-137 and Be-7 were carried out in three Moroccan agricultural sites: Marchouch, Harchane and Oued Mellah located in Rabat, Tétouan and Chaouia-Ouardigha regions, respectively.

In these sites, fallout Cs-137 measurements allowed a retrospective assessment of long term (50-60 years) soil redistribution rates while fallout Be-7 (half-life of 53 days) was used to document short term soil erosion associated with rainfall events for different tillage systems and land uses.

Long term soil erosion rates of the three regions evaluated by the Cs-137 method, ranged from 8 to 58 t/ha/yr. Mostly located in the upslope part of the fields, the eroding zones represented more than 70% of the total area. For the experimental sites in Rabat and Tétouan, the results obtained using Be-7 indicated that soil loss has been reduced significantly under no-till as compared to conventional tillage. Indeed, soil erosion rates were lowered by 50% for the Marchouch site and by 40% for the Harchane site.

Concerning the Oued Mellah watershed, the results highlighted that high density Atriplex plantations have reduced soil loss by approximately 60 to 80%, while for the site under fruit plantations and cereals, soil erosion has been decreased by 58%.