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## Testing sudden shifts in drylands through manipulative mesocosm experiments

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A variety of theoretical and observational works indicate that drylands may experience sudden shifts from functional to degraded states in response to gradual increases in human and climatic pressures. However, there is little experimental testing of the factors and processes that control sudden shifts in drylands. Adopting a combination of mesocosms and manipulative experimental approach, we assessed the occurrence of sudden transitions towards degraded states in response to increasing pressure, and investigated the mechanisms underlying the observed dynamics. We mimicked a gradually increasing pressure of grazing and wood gathering by removing increasing amounts of vegetation on a series of experimental plots and mesocosms. We then monitored the impact of such gradient of pressure on runoff and sediment yield, vegetation dynamics, bare-soil connectivity and soil-surface condition over a 7-year period. Overall, our results support that decreasing plant cover nonlinearly increases the loss of resources from the system and may trigger a change to a degraded state. Within the range from 40% to 30 % vegetation cover, a small change in the cover percentage resulted in a turning point in both the vegetation and the hydrological dynamics, driving the system to a new state that exhibited lower capacity for resource conservation all over the study period.