

Abstract

Restoration of degraded drylands is urgently needed to mitigate climate change, reverse desertification and secure livelihoods for the two billion people who live in these areas. Bold global targets have been set for dryland restoration to restore millions of hectares of degraded land. These targets have been questioned as overly ambitious, but without a global evaluation of successes and failures it is impossible to gauge feasibility. Here we examine restoration seeding outcomes across 174 sites on six continents, encompassing 594,065 observations of 671 plant species. Our findings suggest reasons for optimism. Seeding had a positive impact on species presence: in almost a third of all treatments, 100% of species seeded were growing at first monitoring. However, dryland restoration is risky: 17% of projects failed, with no establishment of any seeded species, and consistent declines were found in seeded species as projects matured. Across projects, higher seeding rates and larger seed sizes resulted in a greater probability of recruitment, with further influences on species success including site aridity, taxonomic identity and species life form. Our findings suggest that investigations examining these predictive factors will yield more effective and informed restoration decision-making.