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MONITORING VEGETATION DYNAMICS FOLLOWING FLOODWATER SPREADING IN ARID AREAS

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Abstract

There is no detailed information about the trend of vegetation changes under floodwater spreading (FWS) programs in arid areas. Here, vegetation cover and composition were monitored using 30 permanent plots along transects through 8 years (2012-2019) FWS program in central Iran's sandy clay loam soil. Vegetation evaluation was performed annually. At the end of the experiment, soil sampling was performed from the plots to study soil-vegetation relationships using principal component analysis (PCA). An area adjacent to the FWS area was also considered as a control. Based on the results, the FWS significantly changed the vegetation characteristics and improved some valuable species. The largest changes in vegetation occurred during 3-4 years of FWS. Cover and density of perennial species increased by 240% and by 144%, respectively. Also, cover and density of annual species showed a decrease of 23% and 46%, respectively after 8 years. Moreover, the cover and density of the forbs increased, while cover and density of the grasses decreased. Shannon richness and Margalef diversity indices increased in first 4-5 years and then showed a decrease during the last three years of FWS program. Based on the PCA results, clay, organic matter, soil moisture, saturation percent, porosity were correlated with cover/density/biomass of plant species after 8 years FWS program. Overall flood spreading caused changes in vegetation development, and managers should be aware of the greater undesirable change in vegetation in future as a result of continuing FWS.

Key words: degraded lands, flood management, species diversity, vegetative characteristics

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