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Watershed health assessment to monitor land degradation

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Land degradation is a worldwide issue that affects the Planet and the fate of the humankind (Cerdà et al., 2009; Choudhury et al., 2016; Fernández et al., 2016; Ferreira et al., 2016). Several processes affect the sustainability of the ecosystems, from soil erosion to soil compation, deforestation, Climate Change or water, soil and air pollution (Sadeghi et al., 2015a; 2015b; Gómez-Acanta et al., 2016; Mengistu et al., 2016; Mukai, 2016). Several ecosystem theories have been presented in the scientific literatures to monitor land degradation (Cerdà et al., 2016; Davudirad et al., 2016; Fava et al., 2016; Mahyou et al., 2016; Soulard et al., 2016). Besides the scientific tasks of improving the indication, the conviction of the potential users to change their concepts toward a higher consideration of ecosystem attributes, and toward a fruitful application of the health or integrity concepts, will be a main task of future activities. Reliability, resilience and vulnerability (R-R-V) indicators are often used in combination for quantifying risk and decision making in many systems. However, the use of hydrological series data for R-R-V computations has been rather limited. Toward this, the overall objective of this paper is to conduct a risk assessment analysis on stream flow discharge from Shazand Watershed located in the south western of Markazi Province in Iran for the period of 1972–2014 using R-R-V indicators. Based on the R-R-V analysis conducted in this study, the stream flow discharge of the study region followed a cyclic pattern with a decreasing trend. The results further showed a decreasing trend in reliability and resilience and an increasing trend in vulnerability in the Shazand Watershed. It may be concluded that the Shazand Watershed was in overall in unhealthy condition from view of stream flow discharge.

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