Description of Ecological Resilience, Vulnerability and Robustness Concepts in Rangeland Ecosystems Management

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Rangeland ecosystem management is encountered with potentially confusing terminology of resilience, robustness and vulnerability. This study was aimed to identify the concepts and uses of these terminologies. For the analysis of these defined concepts and theie applications used to manage rangeland ecosystems, suitable background for each of them was searched and some examples are given for Iran. According to the results, with increasing the disturbance ecosystem into operation situated in the robustness, vulnerability and resiliency of ecological position. Ecological resilience is useful when ecosystems risk losing the ability to recover and requires system modeling, and disaster step is the suitable time for using of this criterion. Also, this concept used for analysis of ecological-social networks when reducing the network self adaption capacity. Ecological vulnerability can either be quantitative, measuring the ability of a system to remain above a critical threshold and used to evaluate the exposure of ecosystem to disturbance and attributes that confer adaptive capacity and sensitivity to disturbance. Vulnerability is very well to assessments of coupled social-ecological systems. Ecological robustness measures the ability of ecosystem to maintain itself within a narrow range of function and is ideally suited to problems that require careful setting of upper and lower bounds for ecosystem properties, such as optimal yield, and one step before than disaster the suitable time for using of this criterion. Ecological robustness is defined as the capacity of ecosystem to maintain a desired state despite fluctuations in the behavior of its component parts or its ecosystems, and two steps before than disaster the suitable time for using of this criterion. In other means, a strong ecological implications of the lack of flexibility, it also describes the ability of ecosystems for innovation and adaptation in anticipation of or in response to internal or external disturbance and turmoil is the right time to use this concept, two before the environment is critical.

Key words: Natural ecosystems management, Resilience, Robustness, Vulnerability.

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