

Farm households' resilience scale under water scarcity

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Abstract In light of climate change, increasing water scarcity and growing interest in resilience as an important dimension of sustainability of socio-ecological systems, the aims of this article were to (1) develop a scale for measurement of resilience of socio-ecological systems under water scarcity and (2) illustrate that the developed scale has validity and reliability. A nine-step approach was documented for development of the Farm Households' Resilience Scale (FHRS). The data were collected from 450 farm households around Parishan wetland, Fars province, Iran. This wetland has been selected by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a biosphere reserve and recorded as an international wetland. The data were subjected to factor analysis at different steps in order to develop FHRS. The final study outcome was a scale with 31 questions to assess farm households' resilience under water scarcity. The validity and reliability of this scale were tested and verified. Considering the challenges researchers and policy-makers facing to improve resilience of socio-ecological systems in an effort to mitigate disasters such as water scarcity, use of FHRS makes it easier to compare findings and evaluate the impact of mitigation policies and programs. Although the Parishan Wetland was used as the study area of this study, the developed FHRS has application far beyond the geographic limits of this area.

Keywords Farm household · Indicator · Sustainability · Resilience · Scale · Water scarcity

1 Introduction

According to the United Nations Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, global warming will lead to more water scarcity, and it is estimated that water stress will be the main concern for between 1.0 and 2.0 billion people by 2050s (Kundzewicz et al. 2007). While climate change impacts impair sustainability, decrease

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