Sustainability under uncertainty as ecological-economic viability

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Strong sustainability, according to the common definition, requires that different (economic and natural) capital stocks have to be maintained as physical quantities each. Obviously, this definition neglects uncertainty. To define strong sustainability under uncertainty, we draw on ecological population viability analysis – a species' population is called viable, if its probability of survival over a given time horizon is equal or higher than a predefined value. Based on this ecological concept, we develop an ecological-economic concept of viability that provides an operational measure of strong sustainability under conditions of uncertainty. We demonstrate the usefulness of this concept by applying it within an ecological-economic model of livestock grazing in semi-arid rangelands.