

Are some human ecosystems self-defeating?

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Complex patterns of human behaviour are difficult to capture in agent-based simulations of socio-ecological systems. Even knowing each individual agent's strategy at one point in time may not help when trying to predict the collective behaviour of certain systems – e.g. if it is in each agent's best interest to do the opposite of most other agents. In self-defeating situations like these, the collective population of agents may exhibit a panorama of simple or complex behaviour, depending on the extent to which useful information is shared. An extreme example is the bar problem, in which a simulated population of bar attendees oscillates in a seemingly random manner around a critical congestion level. This paper suggests that several resource management problems involving human interactions with ecosystems may possess a self-defeating character. This poses new challenges for integrated resources management. A case in point is the potential over-fishing of fisheries, which is addressed in the paper and likened to a minority game. It is concluded that a mix of innovative and imitative behaviour may be the key to overcoming self-defeating tendencies.