Adaptive dynamics for the Baliga-Maskin model of contribution for a public/common good

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The problem of the consumption or provision of common and public goods is a well known and well studied problem in economic sciences. The nature of the problem is the existence of non-excludable externalities which gives rise to incentives to free-riding behaviour. There are several economical frameworks trying to deal with the problem such as coalition theory or mechanism design and implementation theory to ensure a Pareto efficient consumption or provision of such good. Baliga and Maskin considered an environmental game where several communities face a problem of pollution reduction. They show that all communities except one of them have incentives to act as a free-rider, i.e. only one community is willing to face the costs that air cleaning implies, namely the one with greatest preference for the good. In this work we introduce an adaptive evolutionary dynamics for the generalization of the Baliga-Maskin model to quasi-linear utility functions. We show that the Baliga-Maskin equilibrium is the only asymptotically stable dynamical equilibrium, all others being unstable. This result reasserts the problem of free-riding and externalities for the case of a common good in a dynamically/evolutionary setting, and reiterates the relevance of mechanism design and coalition formation in the context of dynamical models.

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