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## Designing Conservation Auctions in Developing Countries: Insights from Field Experiments in Kakamega, Kenya

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### Abstract

Payments for ecosystem services (PES) are an increasingly used instrument both for financing and implementing ecosystem conservation. PES could help to implement conservation measures such as corridors and buffer zones for Kakamega Forest Protected Area in Kenya. However, because landholders' specific costs are not known to the conservation agency, procurement auctions have been conducted (in developed countries e.g. US and Australia) and shown to be effective instruments to reveal these costs. The main goal of this study is to experimentally investigate the effectiveness of different auction designs: the price rule defining how auctions' winners are paid (whether uniform or discriminative prices) and if communication and learning effect over time affect the effectiveness of the auction.

Because more complex auction design may become analytically intractable, more complicated settings have been tested using experiments with human subjects (economic experiments) or artificial intelligence (agent based models). In this study, economic experiments are used to investigate the bidding behaviour of landholders around Kakamega Forest. In these experiments, PES auctions are simulated where landholders participating in the experiments are the buyers and the experimenters, the sellers. Four treatments were designed to allow the test of price rule and communication separately in repetitive auctions with 10 periods. In total, sixteen experiments were conducted in four villages.

Results show that the discriminative price rule is more cost effective than the uniform price, however the effect of communication has not been shown to be significant. Further tests are being conducted to investigate learning effects over time. The results of this study give insights to cost-effectively implementation of PES via conservation auctions, contributing to conservation policy in developing countries.

**Keywords:** Conservation auctions, Kenya, payments for environmental services