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The Value of Private and Public Goods from Agro-Forest Ecosystems and Native Pollinators - The Case of Selected Rural Communities in Northern Thailand

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Abstract

The international community is showing increasing concerns regarding the continued decline of wild and managed pollinator populations worldwide, a phenomenon that has been recognised to be mainly caused by agricultural intensification, pesticide use and habitat loss. Animal-mediated pollination, especially as provided by bees, is responsible for about 35 % of the global food production.

Many native bee species of Europe and North America have been reported to be declining or threatened to disappear, making agriculture increasingly reliant on the pollination services provided by a single bee species, namely the European honeybee *A. mellifera*. Moreover, domesticated and feral colonies of this species have been driven to severe declines, to a large extent on account of an ectoparasitic mite that is native to Asia. This development should serve as a warning for agricultural systems in the tropics, where crop pollination is more susceptible to failure due to surrounding land use changes.

There is evidence that in some regions of Thailand deforestation and the overuse of pesticides have led to important declines of native bee populations, further causing losses in agricultural productivity. Thailand is endowed with a great diversity of stingless bee species and honeybees (with the exception of *A. mellifera*, all other 8 honeybee species of the world are indigenous to the Southeast Asian subcontinent). Nevertheless, Thailand's efforts to promote beekeeping have been mainly focused on the culture of the European honeybee, notwithstanding its prohibitive costs for smallholder farmers. Meanwhile, the potential to generate additional rural income offered by traditional beekeeping with native bee species remains underestimated.

This study attempts to estimate the value that local farmers of bee pollination dependent orchards place on different strategies intended to conserve native bees. The Discrete Choice Experiment (DCE) method is applied to elicit such value perceptions. The resulting stated choice data is analysed using econometric models, such as the conditional logit and the mixed multinomial logit, which allows calculating the willingness to pay for each conservation strategy. Thereby, the authors aim at finding potentials to integrate the economic incentives of rural smallholders into the global conservation goals for native pollinators and their habitats.

Keywords: Conditional logit, conservation, discrete choice experiment, mixed logit, native bees, pollination

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