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Using local ecological knowledge to identify suitable shade tree species a review of the ShadeTreeAdvice methodology —

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Context: The promotion of agroforestry practices is contingent upon the identification of locally suitable shade tree species. The ShadeTreeAdvice methodology intends to support this identification, through increased reliance on farmers' local ecological knowledge to document large pools of tree species and their provision of ecosystem services (van der Wolf et al., 2016). The methodology is supplemented by an online decision-support tool to tailor tree species selection to individual farmer's needs (www.shadetreeadvice.org). Since its inception in 2016, the methodology was applied in eight coffee and cocoa growing areas across the globe. Objective & Method: We reviewed the results from the eight ShadeTreeAdvice studies to draw general lessons on shade tree species and their provision of ecosystem services in tropical farming systems. We also assessed the validity of the methodology and suggested improvements, based on trials and feedbacks from practitioners of the methodology. Results & Discussion: More than 180 tree species and their provision of more than 10 ecosystem services were documented in the eight ShadeTreeAdvice studies, validating the use of this methodology to support the identification of suitable shade tree species. The review highlighted the importance of trade-offs between environmental services and economic benefits, and the need to better take into account the impacts of shade trees on farming practices on top of their provision of ecosystem services. In future studies, suggested improvements in the methodology will allow the comparison of tree performances in monoculture vs in agroforestry systems. Furthermore, ShadeTreeAdvice practitioners will benefit from improved pathways to validate the outputs of the decision support tool. Finally, investigating the relationships between shade tree species' functional traits and their provision of ecosystem services will enable the generalization of results to new or uncommon shade tree species.