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Compensation as a Strategy for Mitigating Human-Wildlife Conflict in the North Central Province, Sri Lanka: A Choice Experiment Approach

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Abstract

Human-Wildlife Conflict (HWC) poses an escalating burden on both farmer communities and wildlife conservation in Sri Lanka. There is a great potential for compensation-based mechanisms as an effective strategy for mitigating HWC and promoting coexistence. Therefore, this study aims to assess the total economic loss caused by HWC and farmers' willingness to pay for the attributes of improved HWC mitigation programs in the North Central Province. Data were collected from 310 farmer households using a semi-structured questionnaire. The total economic loss was estimated by aggregating both direct and indirect costs, including crop damage, grain loss, livestock damage, property loss, mitigation costs, and the economic value of human injury and fatality impacts, with the latter quantified using the Value of Statistical Life (VSL). A choice experiment was conducted to elicit farmers' Willingness-To-Pay (WTP), and the responses were analyzed using both the Conditional Logit (CL) and Random-Parameter Logit (RPL) models. Model estimations revealed that farmers significantly valued compensation-based strategies. Farmers expressed the highest marginal WTP for the attribute offering 75% additional compensation for death or injury and 25% relief for crop loss, highlighting their preference for direct relief. Community-based shared patrolling was less preferred (specifically when offered without compensation), indicating farmers' reluctance for collective mitigation lacking direct financial incentives. The overall WTP for a comprehensive mitigation package was estimated as Rs. 1,989.24 per farmer household per month, reflecting a considerable economic value placed on effective compensation-based mitigation approaches. The average total household damage cost was Rs. 478,069 per season, with human fatalities accounting for Rs. 362,049 of the cost. Observation of parallel trends in total economic loss estimation and the choice experiment enhances the real-world significance of stated preference. Results emphasize the need for inclusive, well-targeted, species and location-specific, adequately compensated mitigation programs that align with coexistence for rural, vulnerable farming communities with wildlife.

Keywords: *Choice experiment, Compensation, Farmer households, Human-wildlife conflict, Mitigation*