Towards Sustainable Coexistence: An Ethical Evaluation of Technological Solutions to Human-Elephant Conflict

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The rapid development of modern science and technology, including artificial intelligence, GPS tracking systems, and drones, have significantly transformed how humans interact with wildlife, particularly elephants. These technologies are widely used to monitor, manage, and regulate animal behavior and movement. Historically, human interference with wildlife was relatively limited. However, population growth and human needs such as deforestation, infrastructure development, and settlement expansion have intensified human-elephant conflicts by reducing habitat and increasing competition for space. Elephants are recognized as keystone species that play a crucial role in maintaining ecological balance through seed dispersal, habitat modification, and nutrient cycling. Their conservation is therefore essential for sustaining biodiversity and ecosystem stability. As a solution, authorities have introduced various technological methods to manage these conflicts. This study examines whether technological interventions in human-elephant conflict promote sustainable coexistence or disrupt natural wildlife behavior and ecological balance. It aims to evaluate the effectiveness of modern technological methods compared to traditional approaches in fostering sustainable coexistence, through the lens of different ethical frameworks. The study adopts a qualitative, literature-based methodology drawing on Sinhala and English scholarly articles, books and academic online sources. This study focuses on ethical analysis and theoretical interpretation rather than empirical measurement. The data are analyzed through comparative and critical analysis. The findings suggest that technologies such as GPS tracking systems, drones, and electric fencing can reduce human-elephant conflict and improve safety. However, these methods often prioritize human interests by restricting elephants' movements and disrupting natural behavior. The study also emphasizes non-lethal strategies such as natural deterrents like bee fences, buffer crops, early warning systems, and community-based conservation as more ecologically sensitive alternatives. From a utilitarian perspective, these outcomes may be justified if they reduce overall harm. However, deontological ethics challenges this view by emphasizing the intrinsic value of animals and opposing their treatment as mere objects of control. The study concludes that while technology is important in managing human-elephant relationships, its application must be guided by ethical principles that balance human safety with animal freedom to ensure genuine coexistence.

Keywords: coexistence, ecological balance, environmental ethics, human-wildlife conflict