Land Characteristics and Suitability for Asian Captive Elephant Habitat Areas in Myanmar Elephant Conservation-Based Tourism Camps

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ABSTRACT

The habitat of Asian elephants (*Elephas maximus*) is primarily shaped by the interaction of topography, climate, vegetation, soil quality, land cover, and water availability. The purpose of this study is to assess land suitability in elephant habitat areas, integrating the Soil Storie Index Rating and Multi-Criteria Decision Analysis that are based on key environmental variables. The Soil Storie Index was calculated from soil physical and chemical characteristics and then reclassified into soil grades to quantify the land's potential and productive capacity for elephant vegetation growth and Multi-Criteria Decision Analysis evaluation framework using Liebig's law of the minimum was applied to identify the most significant factors that constrain habitat quality. Results show that elephant habitat areas with flat to moderate slopes (<15%) and low elevation (<400 m); good soil fertility for elephant vegetation productivity; appropriate land cover for shade, forage, and less human-elephant conflict; and proximity to a river within 5 km of the camp area for water supply constitute the most suitable elephant habitats. The combination of the Storie Index and Multi-Environmental Criteria Decision Analysis approach greatly improves the ecological significance for captive elephants, ensuring that their habitat requirements are adequately addressed. The final habitat suitability reflects current land conditions, showing that only a limited number of elephant camps possess highly suitable habitats, whereas the remaining camps are categorized as moderately, marginally, or not suitable. This study develops a scientific foundation for the management of elephant habitat with long-term sustainability and conservation strategies for Asian captive elephants in Myanmar.

Keywords: Asian Elephants, Habitat Suitability, Storie Index Soil Rating