

## Ironwood Plant (*Eusideroxylon zwageri*): Conservation of Borneo Endemic Species for Ecological and Local Economic Sustainability

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### ABSTRACT

ABSTRACT The ironwood tree (*Eusideroxylon zwageri*), an endemic species of Borneo, possesses significant ecological and economic value. However, its population continues to decline due to illegal logging, habitat degradation, and insufficient conservation efforts. This study aims to investigate the contribution of *E. zwageri* conservation to ecological stability and the improvement of local community well-being. Using a qualitative method that includes literature review and field-based observation in conservation areas of East Kalimantan, the study identifies the species' critical role in maintaining forest biodiversity and supporting sustainable livelihoods. The results demonstrate that conserving ironwood not only safeguards forest health but also enhances social well-being by providing long-term economic benefits to indigenous communities. This aligns with the United Nations Sustainable Development Goals, particularly SDG 3 (Good Health and Well-being), emphasizing the importance of local ecological resources in promoting quality of life. Therefore, integrated conservation approaches are crucial for sustainable ecological and social outcomes.

### Keywords:

## 132 Introduction

Borneo is home to one of the richest tropical rainforests in the world, containing unique biodiversity, including the ironwood tree (*Eusideroxylon zwageri*), locally known as "ulin." This slow-growing, long-lived tree is renowned for its hardness, resistance to decay, and high economic value in the timber industry (Environmental Investigation Agency [EIA], 2022). Over-exploitation and habitat conversion have led to drastic population declines, classifying the species as vulnerable (International Union for Conservation of Nature [IUCN], 2023). As the ironwood tree plays an essential role in maintaining ecological balance and traditional livelihoods, conserving this species has become urgent (EIA, 2022; Siregar, 2021).

Conservation efforts are not only essential from an environmental perspective but also contribute to human well-being, particularly among indigenous communities who rely on forest resources (Wulansari & Soekmadi, 2015). The study explores how the sustainable conservation of *E. zwageri* can support biodiversity, climate regulation, and local economic activities while contributing to the Sustainable Development Goals (SDG 3) regarding good health and well-being (United Nations, 2015).

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## 133 Research Methods

This research employs a qualitative descriptive approach supported by a systematic literature review. Data were collected through literature studies of relevant scientific articles, conservation reports, and ethnobotanical sources from national and international journals indexed in Scopus, DOAJ, and Sinta. The Preferred Reporting Items for Systematic Reviews was applied in selecting and analyzing articles. In addition, observational data were gathered from selected conservation areas in East Kalimantan, especially near the Balikpapan region, where local efforts to preserve *E. zwageri* have been implemented.

## 134 Result and Discussion

### Ecological Significance

The presence of *E. zwageri* supports the structure of lowland dipterocarp forests. It contributes to biodiversity stability and forest microclimate regulation. As a keystone species, its decline affects the broader forest ecosystem. Its deep roots support water retention, reduce erosion, and increase carbon sequestration.

### Economic and Cultural Value

Local communities have long utilized ironwood for construction and traditional uses due to its durability. Sustainable harvesting and agroforestry involving *E. zwageri* offer potential for community-based economic development. Preserving the species also ensures the transmission of indigenous knowledge related to its uses.

### Economic Opportunities in Balikpapan Context

Balikpapan, as a gateway city to East Kalimantan, is experiencing rapid economic transformation in line with Indonesia's new capital city development. The conservation and controlled utilization of *E. zwageri* in the region may support eco-tourism, craft industries, and sustainable timber cooperatives. Several studies (e.g., Wulansari & Kusuma, 2019; FAO, 2010) highlight the economic potential of forest-based enterprises in Kalimantan that center around endemic species. Community-based conservation models integrated with small-scale business development provide economic alternatives for residents, particularly in urban-rural transition areas like Balikpapan outskirts.

### Contribution to SDG 3 (Good Health and Well-being)

A healthy forest ecosystem provides ecosystem services such as clean air, water regulation, and traditional medicine sources. The conservation of *E. zwageri* helps prevent further forest degradation, thereby indirectly supporting human health. Moreover, stable livelihoods based on sustainable resources contribute to mental and economic well-being.

## 135 Conclusion

Conserving *Eusideroxylon zwageri* is a multifaceted endeavor with ecological, cultural, and socio-economic benefits. Its role in maintaining forest health and providing sustainable income aligns with global goals such as SDG 3. Policy support, community engagement, and integrated management are needed to ensure the survival of this vital species.

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## CITATION:

Elgi Zulfakar Diniy<sup>1</sup>, Atok Miftachul Hudha<sup>2</sup>, Husamah<sup>3</sup> (2025). Ironwood Plant (*Eusideroxylon zwageri*): Conservation of Borneo Endemic Species for Ecological and Local Economic Sustainability. *OASE*, 7(4), 789–791.