Appropriate Forest Management in Biha Resort and its Buffer Areas, Bukit Barisan Selatan National Park, Indonesia

インドネシア、ブキット・バリサン・セラタン国立公園ビハ・リゾートとその緩衝地域における適切な森林管理

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Abstract

Bukit Barisan Selatan National Park (BBSNP) is representative of the *Bukit Barisan* mountain range from north to the south of Sumatra, which consists of mangrove forest, coastal forest, tropical rainforest and mountain vegetation types in Sumatra. Given such uniqueness, UNESCO recognized BBSNP as one of the *Tropical Rainforest Heritage of Sumatra* in 2004. BBSNP is facing a severe biodiversity loss. Several studies have shown serious population declines of key wildlife species (Sumatran tiger (*Pantera tigris sumatrae*), Sumatran elephant (*Elephas maximus sumatranus*), and Sumatran rhinoceros (*Dicerorhinus sumatrensis*)) in BBSNP.

The main purpose of this study was to investigate the causes of biodiversity loss in Bukit Barisan Selatan National Park and formulate recommendations for appropriate forest management by analyzing the interaction between local communities and surrounding forests with the specific objectives were: (1) to analyze the forest ecosystem services used by local communities, (2) to analyze household dependence on forests in BBSNP, and (3) to assess nature-based tourism in Biha Resort and its buffer areas.

Biha Resort and its buffer areas are the target areas for this study. These areas are flanked by forest and coastal ecosystems, the Bukit Barisan Selatan National Park forests and the Indian Ocean. The areas around Biha Resort are famous for surfing and have beautiful beaches. Many tourists come to these areas for surfing and and enjoy coastal panoramas like sunsets. The Biha Resort within the BBSNP emerges as the most important place for biodiversity conservation, serving as an essential habitat for the Sumatran tigers, Sumatran elephants, and Sumatran rhinoceros. The communities around Biha Resort have a traditionally managed forest resource through the practice of *repong damar*.

In order to achieve the main objective and the specific objectives, this study is divided into 5 chapters. Chapter 1 describes the background of the study and issues related to the Bukit Barisan Selatan National Park area. Chapter 2 describes how the Biha Resort and its buffer areas were mapped as study sites. Chapter 2 also shows the results of focus group discussions (FGDs) with community leaders in the buffer areas of Biha Resort (Sukarame, Pelita Jaya, Sumur Jaya, Tanjung Setia, Paku Negara, Tanjung Raya, Marang and Ulok Mukti village) regarding the use of forest ecosystem services. The results of Chapter 2 found that village boundaries overlap with limited production forest, protected forest, Biha Resort, and other Resorts. The results of FGDs revealed that local communities use forest ecosystem services from different types of forests, including BBSNP, limited production forests, protected forests, and customary forests, such as water, food, pets, construction materials, fuel, medicine, raw materials for trade, and other items. They use forest ecosystem services for their subsistence and cash. Food, pets, building materials, fuel, medicine, raw commercial materials, and other materials derived from 8 species of wild aquatic animals from 6

families (fish, snail, and shrimp), 30 species of wild land animals from 16 families (bird, insect, and mammal), and 66 species of plants from 32 families (climber, fern, grass, herb, shrub, tree). Villagers mostly used the forest ecosystem services in customary forests. There is a common practice of *repong damar* in customary forests, which is a form of traditional ecological knowledge and provides various ecosystem services for community livelihoods through agroforestry techniques.

In Chapter 3, through a survey of 128 households from 8 villages around Biha Resort using a semi-structured questionnaire, I identify the characteristics of the community around Biha Resort. Besides, I investigated the determinant of forest dependence in Bukit Barisan Selatan National Park by using multiple regression analysis. I found that they extract forest products in BBSNP and surrounding forests (limited production forests and customary forests). The forest products were derived from 3 animal species and 41 plant species. The most frequently mentioned forest products are from plant species such as *Archidendron pauciflorum* (60.94%), *Parkia speciose* (51.56%), and *Shorea javanica* (46.88%). Households collected more products from customary forests. These results are consistent with the FGD results in Chapter 2, which showed that community extraction of forest resources in non-national park forests was greater and more diverse than in national park forests, particularly in customary forests. The results of the multiple regression analysis show that age and buffer forests dependency, especially in customary forest, have a significant impact on household dependence on forests in Bukit Barisan Selatan National Park.

Chapter 4 provides an assessment for developing nature-based tourism in the Biha Resort and its buffer areas. This chapter aims to assess the suitability of the Biha Resort's buffer areas for nature-based tourism, investigate local attitudes toward a nature-based tourism development plan, and investigate tourist preferences. Based on an assessment of the criteria for attractions, accessibility, and tourist facilities, Biha Resort and its buffer areas are highly suitable for developing nature-based tourism, with a total accumulated score of 46 (90.2%). According to a survey of 197 households in 8 villages, comprising 80.7% male and 19.3% female respondents, 48% very agreed and 41% agreed with the proposed nature-based tourism development plan in their village areas. Interviews with 32 domestic and 31 international tourists revealed that 93.75% of domestic tourists and 64.52% of international tourists chose seascape as their preferred attraction. Meanwhile, 81% of domestic tourists chose sightseeing/relaxing as their preferred activity, and 54.8% of international tourists chose swimming/bathing.

Chapter 5 discusses the key findings of Chapters 2, 3, and 4. In order to conserve biodiversity and improve the well-being of the surrounding community, the management of the Biha Resort must be integrated with the management of the surrounding area. This chapter underscores the importance of traditional forest management through the *repong damar* practices, which provide more natural resources for community livelihoods and play a role in maintaining the sustainability of Bukit Barisan Selatan National Park. This chapter proposes several recommendations for the management of Biha Resort and its buffer areas. It consists of several proposed actions, including boundary mapping, forest resource mapping, education on threatened resources, optimization of private lands, conservation of customary forest (*repong damar*), optimization of non-timber forest products, community-based ecotourism, buffer zone designation, forest-dependent community investigation, and stakeholders identification.