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Uses and conservation of plant diversity in Ben En National Park, Vietnam

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GENERAL INTRODUCTION

TROPICAL FORESTS

This thesis concerns the interactions between plant diversity and plant uses by the local population in Ben En National Park, Vietnam. The study should be viewed against the background of global concerns about the current status and future sustainability of tropical forests.

Tropical forests are characterized by very high plant diversity; covering less than 10% of the total land areas; they possess more than 50% of all known plant species on earth (Wilson 1988; Mayaux et al. 2005). The international Convention on Biological Diversity signed in Rio de Janeiro in 1992 strongly emphasized the need for biodiversity conservation. From that global perspective, despite numerous efforts to conserve biodiversity, tropical forests have severely declined in the last 16 years and still continue to decline (Johnson 1993; Achard et al. 2002; Chien 2006; Butler & Laurance 2008; Putz et al. 2008). During the past decades, around 6 million ha of tropical forests have been lost (Achard et al. 2002). The main causes are agricultural expansion, over-harvesting of tropical hardwoods, development of plantations, mining operations, industry, urbanization, and road building (Geist & Lambin 2002; Chien 2006). Among tropical areas, South-East Asia has the highest relative rate of deforestation (Achard et al. 2002; Brook et al. 2006; Chien 2006). Tropical forests are important for global environmental ecosystem function (Fearnside 1997; Laurance 1999), they also provide subsistence needs and income for hundreds of millions of people worldwide (Iqbal 1993; Walter 2001), often the very poor (Ticktin 2004).

A successful biodiversity conservation strategy requires a good understanding of the relationships among natural resources and social conditions. This is particularly important for tropical countries, where the forests are very rich in biodiversity, but are being lost at an alarming rate (Whitmore 1997; Sodhi et al. 2004; Chien 2006).

FORESTS AND BIODIVERSITY IN VIETNAM

Vietnam is a country rich in biodiversity (Thin 1997). The country was ranked as the 16th most biologically diverse country in the world (WCMC 1992; Hoang et al. 2008 a). Forests covered around 43% of Vietnam before 1954 (Maurand 1943; Lung 2001). However, the forests of Vietnam were severely damaged by many causes, such as the war with the United States of America, overexploitation, shifting

cultivation, and agricultural expansion. As a result, the forest cover declined to an estimated 30% in 1985, and 28% in 1995 (Lung 2001; Hoang et al. 2008 a). In 1998, the 5 million ha Reforestation Program was launched by the Vietnamese government with a target to plant 5 million ha of forests by 2010, restoring the forest cover to 43% (Lung 2001). The program aims not only to reforest, but also to protect existing natural forests. In recent years the forest cover of Vietnam has gradually increased (Hung 2004; Lan et al. 2006; Hoang et al. 2008 a). However, the quality of the forests is still low as most of the forests are poor in timber volume and tree species diversity and density as a result of a long time of overexploitation (Dang 2001; Chien 2006). On the other hand, to protect the rich and threatened biodiversity, the Vietnamese government has established a system of protected areas (Tai 1995; VN 2003; Hoang et al. 2008 a): in 2006, Vietnam had 126 protected areas, with a total area of 2.54 million ha (Hoang et al. 2008 a).

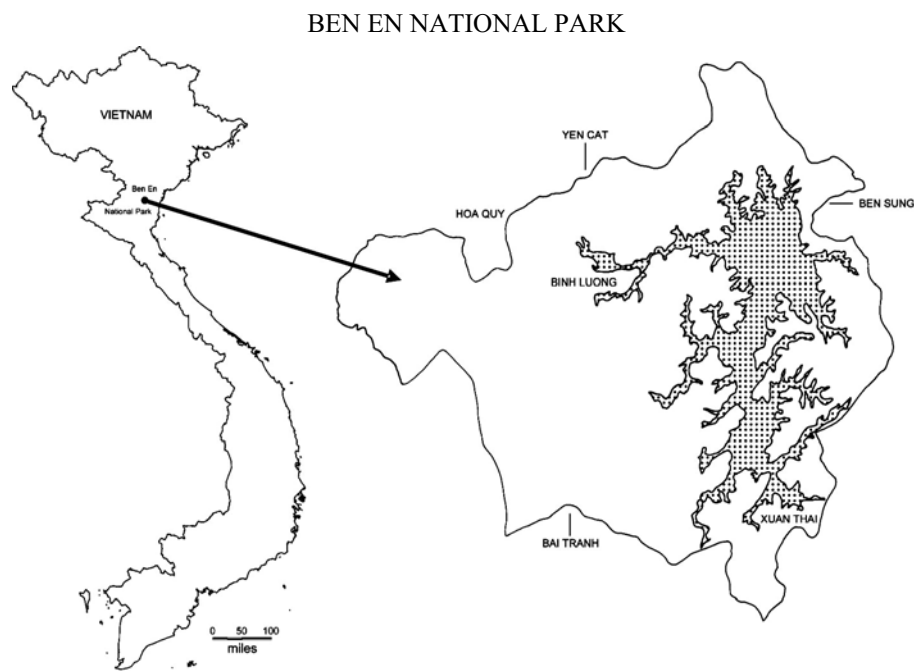


Fig. 1.1. Map of Ben En National Park in Vietnam (inset – lakes are dotted)

Our study focuses on Ben En National Park, one of the 30 National Parks in Vietnam (Forest Protection Department 2006). Ben En National Park is situated in Nhu Thanh and Nhu Xuan districts of the Thanh Hoa province in Vietnam $19^{\circ} 30'$ to $19^{\circ} 40'$ N by $105^{\circ} 21'$ to $105^{\circ} 35'$ E (Fig. 1.1). The Park was established in 1992 to conserve the rich, but seriously threatened biodiversity of the country. The Park is inhabited by 18,000 local people belonging to five ethnic groups. The majorities of the people who are living in the National Park belong to the Kinh, Thai, Muong and Tay ethnic groups; although there are also a small number of Tho people. Their life

still depends on forest resources, Non Timber Forest Products, as well as timber (Hoang et al. 2008 b & c). The vegetation of Ben En National Park has been strongly influenced by human exploitation (Khoi 1996; Hoang et al. 2008 a). The forests were commercially logged as late as 1992, and small-scale, illegal logging continues to this date (Tordoff et al. 2000; Hoang et al. 2008 a & c).

OBJECTIVES OF THIS STUDY

The aims of this thesis are:

- To inventory plant species diversity, their life forms and their conservation status, and the vegetation types in Ben En National Park.
- To survey medicinal and non-medicinal plant uses and the role of plant resources in the economy of the indigenous communities in Ben En National Park.
- To analyze the impact of human and environmental factors on plant diversity and composition in Ben En National Park.
- To use the resulting information and understanding to underpin recommendations for future management of Ben En National Park and other protected areas.

OUTLINE OF THE THESIS

Following a general introduction, **Chapter 2** focuses on the diversity of plant families, genera, species, life forms, conservation status, and the vegetation types recorded during a two years survey in Ben En National Park from 2005 to 2007. In addition we briefly review the status of forest biodiversity and causes of biodiversity loss in Vietnam.

Chapter 3 deals with the numerous medicinal plant species and their uses by local people in Ben En National Park, and analyzes the role of medicinal plants in the indigenous communities. In addition this chapter presents a comparison of the situation in Ben En National Park with other local communities depending on natural forest resources in and beyond Vietnam.

Chapter 4 addresses the great diversity of non medicinal useful plants in food, construction, firewood, household tools and related products, and other uses; and analyses the impact of local use on the conservation status of some of the utilized species.

Chapter 5 focuses on the impact of human and environmental factors (mainly soils) on plant diversity and forest structure in Ben En National Park, and gives some recommendations for developing a sustainable management of Ben En National Park based on the results of the analysis.

