A. FLORA OF CAMBODIA

1. Introduction

In the Indochina Region, a number of tree species are vulnerable to extinction at the species and population levels. It is also recognized that the maintenance of forest genetic resources is essential to sustainable development. Thus various countries are endeavouring to conserve the genetic diversity of useful and economically important tree species that are native to the region.

The first list of 21 priority tree species for gene conservation in Cambodia was established during the Second Forest Gene Conservation Meeting on January 29, 2002, organised by Cambodia Tree Seed Project. The identification and selection of priority tree species was based on the value of present and future uses of various plants, their relevance to contemporary tree planting programmes and subsistence economies, as well as their conservation status.

The aim of this paper is to provide a descriptive profile of selected priority species regarding their natural history, ecological requirements, natural distributions, present-day distributions, uses, genetic characteristics, vulnerabilities, and conservation status.

2. Botanical Work in Cambodia

Generally speaking, botanical work in Cambodia has been very limited. Until recently, our understanding of the country's flora and vegetation reflected the *ad hoc* activities of a small number of botanists and foresters. Most of these authors have studied a limited number of vegetation types, sites, or ethnobotanical aspects of Khmer culture, and most of these works were produced before the political and economic implosion of Cambodia in the 1970s.

Investigations in Cambodia and other parts of French Indochina commenced in the latter part of the nineteenth century, leading to the publication of seven volumes of the definitive *Flore Generale de l'Indochine* (Lecompte 1907-1942). These volumes describe over 8,000 species from Cambodia, Laos, and Vietnam. Supplementary volumes commenced in 1964, with the publication of the *Flore du Camboge, Laos et Vietnam*. By 1994, 27 volumes addressing 71 of the 164 families were published.

Dy Phon (1981, 1982) indicates that Cambodia possesses 2,308 of the 8,000 species described in the Flore Generale de l'Indochine. These 2,308 species belong to 852 genera in 164 families, and include:

Gymnosperms:	*7 genera*	*14 species*
Monocotyledons:	*219 genera*	*488 species*
Dicotyledons:	*626 genera*	*1,806 species*

Taxonomic revisions that have been published over the last few decades suggest that many more species will certainly be discovered. Current estimates place the total number of plant species in Cambodia, Laos and Vietnam from 12,000-15,000 (IUCN, 1995). The full

list for Cambodia is expected to exceed 3,000 species (Dy Phon, 2002, pers. comm.), with expectations that at least 700 additional species will be described as new to science in the country. It may be assumed that a minimum of ten percent of these species will be endemic to the country. The World Conservation Monitoring Centre 2000 estimates 8260 plant species in Cambodia, 10% endemic of which will be endemic. There is, therefore, still considerable scope for further documentation of the flora of Indochina. This is thought to be particularly true for Cambodia, which has never undertaken a systematic, national inventory of its flora.

Dy Phon (1970, 1971) provides the only systematic vegetation survey that considers all vascular flora of an area. Her treatise of the flora and vegetation of the Bay of Kampong Som, Phnom Bokor of the Elephant Mountains, and the Kirirum plateau, as well as Ashton's (1964) brief descriptions of the coastal hinterlands of the Cardamom Mountains, represent the more substantial botanical works in Cambodia.

Dy Phon's work has been complemented by a range of forest inventories and surveys of medicinal and other useful plants (eg. Ashton 1964; Eav Bov Bang 1970; FAO 1970; Martin 1973, 1997; and Rollet 1962, 1972a, 1972b and 1972c). Forest inventories were not accompanied by assessments of the full range of plant resources, and no naturalist has ever described forest areas over 1,100 meters elevation in Cambodia. Rollet (1972c) provides, however, a preliminary listing of some common genera at higher altitudes. Legris and Blasco (1971, 1972) and Dy Phon (1981) have synthesise much of this information to provide a national overview of Cambodia's vegetation types and their principle species. More recently, McDonald et al. (1997) conducted a detailed survey of the flora of the Tonle Sap floodplain, and in 1998, FAO undertook the establishment of a forest inventory process with MAFF/FA. From 1998 to the present, the FA, in cooperation with international environmental NGOs such as FFI, ARA, CAT, WCS, WWF, and CI, have conducted conservation surveys. The result of these activities has led to some updates to the Cambodian check list of especially fauna, and to lesser extent of flora. They have also established three new protected zones in the Cardamom Mountain region.

Cambodian forests are dominated by species of Dipterocarpaceae, Leguminosae, Lythraceae, or Fagaceae, and in some places Pinaceae, Podocarpaceae, or bamboo. Lowland floras of Cambodia are typical of the *Indochinese* Floristic Province (and as such, contrasts with that of Chinese, Indo-Burmese, and Indo-Malayan Biogeographical Provinces), whilst the highland floras share a closer affinity with those of the Indo-Malayan region (Dy Phon 1982).

Legris and Blasco's (1972) vegetation map remains the most ecologically sensible map for Cambodian forests, even though considerable deforestation and degradation has occurred since the time of their study. This earlier map has recently been reviewed, and is commercially available through the French company ECOCART, though not yet available in Cambodia.

Whilst in recent times botanical research has increased, many species are yet to be documented. In view of the rapid depletion of the forest resources, such work is of great importance in order to identify useful species before they are lost. Such information will lead to the identification of appropriate options for different forest management systems.

High market prices and demands for commercial trees are leading to the extinction of rare and endangered species in Cambodia. As forest resources continue to be depleted,

indigenous seed sources are also degraded, thereby reducing potentials of forest regeneration in Cambodia. In order to begin to address this issue, 21 tree species have been selected for gene conservation. Gaps in our current knowledge of priority species are evident in this document; and in addition, botanical studies indicate that many species within the country have not been documented.

Human and financial resources remain very limited within the country, but it is important to strengthen capacity for gene conservation and reforestation activities in order to better manage and conserve priority species and sustain the natural resource base. Without such measures, future generations may not have the chance to benefit from these species.

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