



Oleoresin from dipterocarps: harvesting techniques, resource management and livelihood issues in Vietnam and Cambodia

Dipterocarps and oleoresin

Dipterocarps are not only keystone species in forests of Southeast Asia (Fig. 1) but also a major source of resin - a non-timber forest product. The resin from dipterocarps may be classified into two groups: oleoresin (liquid resin or wood oil) or *chor teuk* in Khmer local language - and solid resin. The oleoresin, which is collected from *Dipterocarpus* species, has been used more widely than the solid resin, which is collected from *Hopea*, *Shorea* and *Vatica*.

Dipterocarpus alatus (Fig. 3) is the main source of the oleoresin in Indochina.



(Fig.1) Dipterocarp forest in Preah Vihear (Luu, CBD)



(Fig. 2) Dipterocarps in Monduliri (Khou, WWF)



(Fig. 4) *Dipterocarpus alatus* (Khou, WWF)

The oleoresin from the species is known to have been used to produce a secret glue to bond bricks in the famous Cham temples in Central Vietnam.

Other *Dipterocarpus* species with importance for the oleoresin production in Indochina are *D. intricatus* (Fig. 4) , *D. dyeri*, *D. turbinatus*, *D. costatus* and *D. cf. condorensis*.

The liquid and/or solid resins from other dipterocarps may be mixed together for producing a torch, caulking boats (Fig. 5), traditional medicine, or for manufacturing paints and varnish.



(Fig. 4) *Dipterocarpus intricatus* (Khou, WWF)



(Fig. 5) Currently, the demand in Vietnam for oleoresin is from the domestic fisheries industry for caulking new fishing boats and recaulking every year. There are other commercial uses for oleoresin including for manufacturing paints and varnish (Luu, CBD)

Livelihood importance and issues

Oleoresin is an important income source for many forest communities in Vietnam and Cambodia, particularly in periods of rice shortages, which could last up to 6 months in any given year.

Resin studies in Northeastern Cambodia showed that the village population of resin tappers in Ratanikiri and Monduliri provinces range from 34% to 86%, with family ownership of trees ranging from 35 to 260 resin trees per family (Evans et al, 2003; McKenney et al, 2004; Baird, 2005, Khou et al, 2007).

Current policy options in Vietnam and Cambodia do not fully enable forest-reliant communities to gain adequate benefits from resin tapping and trade. In Vietnam, most natural dipterocarp forests, which are the prime source of oleoresin, are located in protected areas, where resin tapping is strictly prohibited. However, despite the prohibition, resin tapping seems to continue with few incentives for forest protection.

In Cambodia, besides the subsistence and customary use of NTFP, community forest and protected area policies and guidelines are not explicit about the commercial use of NTFPs by primary collectors for value-added livelihoods. Sustainable resource management plans are still underdeveloped in community forests and community protected areas today. In addition, there is a dearth of data to track the volume, price and profit margins of resin trade within and between countries like Cambodia and Vietnam.



(Fig. 7) Farmers in the buffer zones of Binh Chau, Phuoc Buu and Ta Kou nature reserves in Vietnam tap for resin after working in the rice fields (Luu, CBD).

Harvesting techniques and issues

Traditionally, tapping is the main practice to harvest the oleoresin from dipterocarpus in Indochina. A side of a woody trunk of at least 45 cm in diameter at breast height is chopped to make a backwards-sloping hole from 0.4 to 1.0 m above the ground using an axe (Fig. 8). The oleoresin is exudated from the woody vascula and stored in the hole. Fire made from the oleoresin is used as a stimulant to make the oleoresin exudate after the first harvesting (Fig. 9).



(Fig. 7) Liquid resin tappers use different equipments to chop the holes and to collect liquid resin. (Khou, WWF).



(Fig. 9) After chopping, the hole is burned for around 2 minutes and left for up to 6 days for exudation. Liquid resin is regularly collected in 6 days after burning the hole. (Luu, CBD & Khou, WWF).



(Fig. 8) Collection holes are made by resin tappers at variable heights above ground from 20 to 130 cm and the mean height of the liquid resin holes is 69 cm above the ground. The holes of the liquid resin trees are chopped on the ridge of vertical roots because it produces more liquid resin. (Luu, CBD & Khou, WWF).

However, this produces charcoal which prevents the oleoresin from flowing from the woody vascula to the hole (Fig. 10).



Resin pool (Khou, WWF)



(Fig. 10) Charcoal formation in tree hole (Pinto, NTFP-EP).



(Fig. 11a) Abandoned tree (Khou, WWF)



(Fig. 11b) Abandoned tree (Pinto, NTFP-EP)

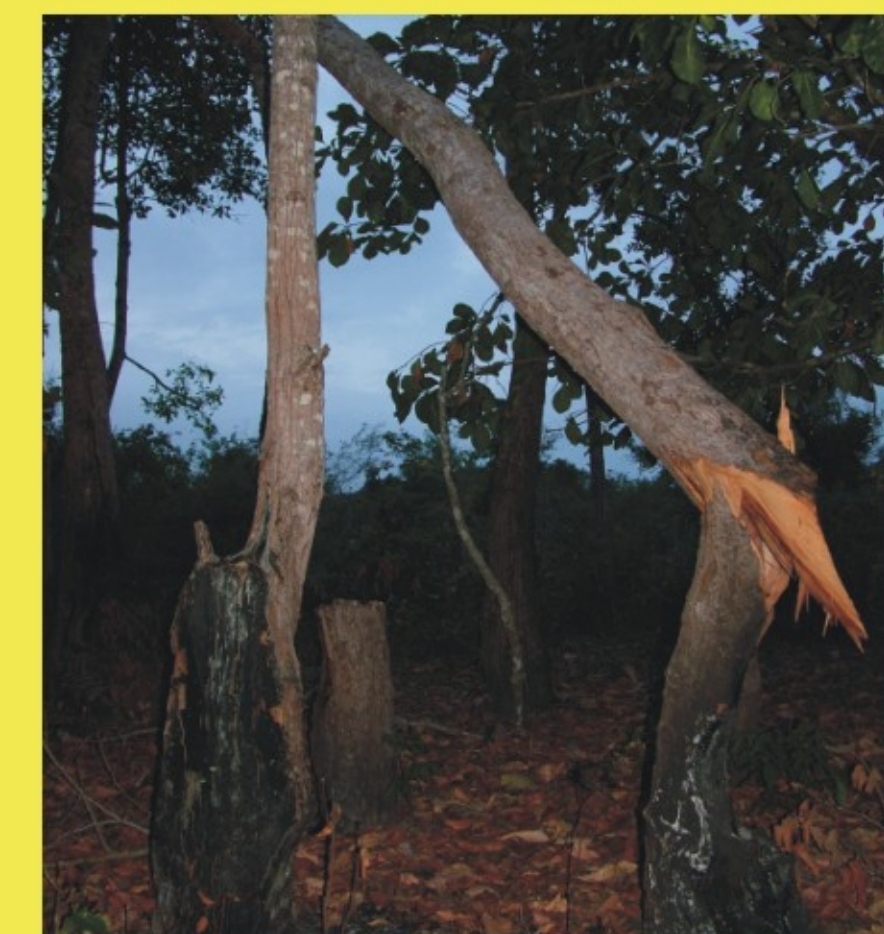


(Fig. 12) Water prevention technique (Pinto, NTFP-EP)

Proper care is observed to avoid excessive production of charcoal that results in a low resin yield. Trees that produce low to no resin yield are eventually abandoned (Fig. 11a and 11b).

Some local resin tappers have their ways to prevent water from mixing with the resin especially during the rainy season (Fig. 12). Otherwise, tappers make sure to clean the hole before the next collection.

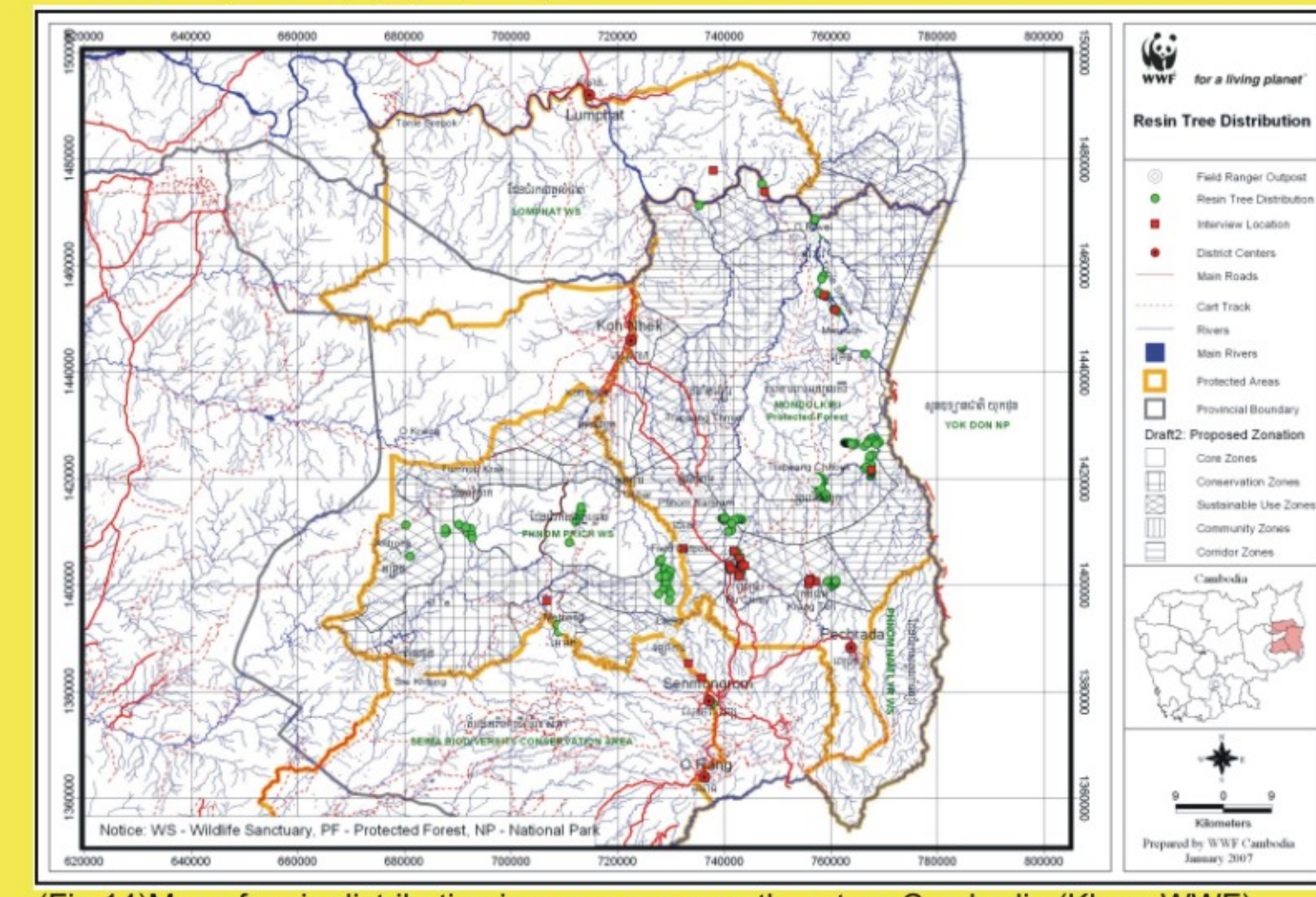
In Yok Don National Park in Dak Lak Province, Vietnam, it is known that dipterocarp forests are sometimes fast burned to stimulate the exudation of resin from dipterocarps. However, the exudated oleoresin becomes hard when harvested. Despite the risks of forest fires, tapping for oleoresin continues. In southern Vietnam, with the banning of resin tapping, community forest protection has been weak; it has been observed that more oleoresin trees have been logged and then "illegal" tappers tend to be less careful in the selection of trees to be tapped and in their chopping practices as a whole. (Luu, pers. comm.).



(Fig. 13) Tapped dipterocarps in southern Vietnam fallen down by storm (Nguyen, CBD)

In recent surveys of resin collection in the Phnom Prich Wildlife Sanctuary and Monduliri Protected Forest/Sre Pok Wilderness Area in northeastern Cambodia (Figure 14), the findings are that oleoresin yield is steadily declining due to improper tapping techniques and hole maintenance. This was concluded based on observations of a sample of abandoned resin trees. However, the rate of yield decline according to the size and type of trees, the number of holes per tree and the quality of tapping and hole

maintenance have not been ascertained. To date there is no monitoring data available to draw final conclusions.



(Fig.14) Map of resin distribution in survey area northeastern Cambodia (Khou, WWF)

Recommendations

1. Document and disseminate information in local languages of good practices in oleoresin tapping and management techniques to ameliorate the current decline of oleoresin yield and for quality improvement.
2. Research and conduct monitoring surveys to ascertain the rate and causes of oleoresin yield decline vis-à-vis the size and type of trees, the number of holes per tree and the quality of tapping and hole maintenance.
3. Study the supply chain and market demand of oleoresin in the region and elsewhere to determine long-term higher value and returns for local communities.
4. Initiate research and advocacy around the policy and legal corridors for resin management, marketing and trade in Cambodia and Vietnam that will provide fair benefits to forest-reliant communities, especially for ethnic minorities.
5. Explore the feasibility and requirements of planted dipterocarp forests for exploiting resin. These planted forests may be supplemental resin sources to conserved natural forests.

Cultivating the environmental, cultural and economic values of dipterocarp forests can contribute significantly to the livelihoods of forest-dependent communities and to the national economies of Cambodia and Vietnam.

The contents of this poster reflect some of the highlights from the recent Discussion on Sustainable Liquid Resin Resource Management: Sharing of techniques, lessons learned and good practices from Cambodia and Vietnam held in Phnom Penh on May 8, 2007, and the Field Visit and Community

Exchange on Liquid Resin Resource Management in Preah Vihear, Cambodia on May 10, 2007 (Figure 15). The events were organized by the Cambodia NTFP Working Group, an informal network of local and international NGOs committed to give practical responses to a growing interest in NTFP livelihood development and policy support in Cambodia.



(Fig. 15) Community exchange on resin management in Cambodia (Pinto, NTFP-EP)

References:

- Baird, Ian G. (2005). *Dipterocarpus wood resin tree tenure, tapping and trade in Teun commune, Kon Mum district, Ratanakiri province, northeast Cambodia*. NTFP Project, Ban Lung, Ratanakiri, Cambodia.
- Evans, T.D. et al (2003). *A Study of Resin-tapping and Livelihoods in Southern Monduliri, Cambodia with Implications for Conservation and Forest Management* (Phnom Penh: Wildlife Conservation Society)
- Khou, E. et al (2007). *A Study of Liquid Resin Tapping: Scope of Threats, Biodiversity Conservation and Management Approaches in Phnom Prich Wildlife Sanctuary, Monduliri Protected Forest/Sre Pok Wilderness Project* (Phnom Penh: World Wide Fund for Nature Cambodia)
- McKenney, B. et al (2004). *Focusing on High Value Forests: Livelihoods and Management* (Phnom Penh: Wildlife Conservation Society)
- Contributors:**
 Hong-Truong Luu, Center for Biodiversity and Development (CBD), Vietnam
 Khou Eanghoun, Ministry of Environment/Worldwide Fund for Nature (WWF), Cambodia
 Femy Pinto, NTFP-EP for South and Southeast Asia, Cambodia
 Amanda Bradley, Heng Santha, Community Forestry International (CFI), Cambodia

