

Tourism, forest conversion, and land transformations in the Angkor basin, Cambodia

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A B S T R A C T

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The Angkor basin of Cambodia, the site of the great Angkor temple complex, has experienced explosive tourism growth since the 1993 onset of national political stability and renewed international investment, which in turn has driven increasing demand for water, wood, and biomass fuel, and rapid and extensive land-use and land-cover change. We use multi-temporal Landsat imagery (1989–2005) to describe the rate and extent of land-cover change throughout the Angkor basin. While 50% of the landscape remained in rice agriculture it is notable that a larger proportion of the area was deforested (23.4%) than experienced forest regrowth (4.9%). Most forest loss occurred between the Angkor temple complex and Phnom Kulen National Park, and was due in part to charcoal production to serve the tourist industry, and also conversion to permanent agriculture. The small area of forest increase was concentrated along the eastern boundary of the main Angkor complex. The interplay among global (tourism, climate), regional (national policies, large-river management), and local (construction and agriculture, energy and water sources to support the tourism industry) factors drives a distinctive but complex pattern of land-use and land-cover change.

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Introduction

Within the past fifty years tropical, forested landscapes in developing countries have been transformed by economic and social development (Lambin & Geist, 2003; Walker, 2004, Wright, 2005). These transformations are important components of global environmental change (Foley et al., 2005; Moran, 2005; Rindfuss, Walsh, Turner, Fox, & Mishra, 2004). The most rapid and significant include deforestation as a consequence of urbanization, agricultural expansion, logging, and pastoral expansion (Lambin & Geist, 2003). Deforestation remains the dominant mode of land-cover transformation in tropical, developing countries, but the causes of deforestation are diverse and idiosyncratic (Carr, 2004; Geist & Lambin, 2002; Lambin & Geist, 2003; Walker, 2004).

Forests in Southeast Asia are valued for their high biodiversity and commercially important *Dipterocarpus* hardwoods (Kummer & Turner, 1994). At the same time global projections of forest loss are highest in this region. Legal and illegal private and state-run commercial timber harvesting practices, large transmigration schemes, and weak governance have contributed to recent forest losses (Lambin & Geist, 2003). Agricultural expansion is the most commonly cited cause (Lambin & Geist, 2003; Lepers et al., 2005), and a myriad of other forms of economic development also contribute (Chomitz & Gray, 1996).

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In contrast to the economic development of other ASEAN (Association of Southeast Asian Nations) nations, the turbulent and politically unstable history of Cambodia over the last quarter of the 20th century limited infrastructure development, natural resource exploitation, and economic growth (Le Billon, 2000). The horrendous Khmer Rouge period from 1975 to 1979, followed by Vietnamese occupation until 1989, led to a near-total loss of both financial and intellectual capital.

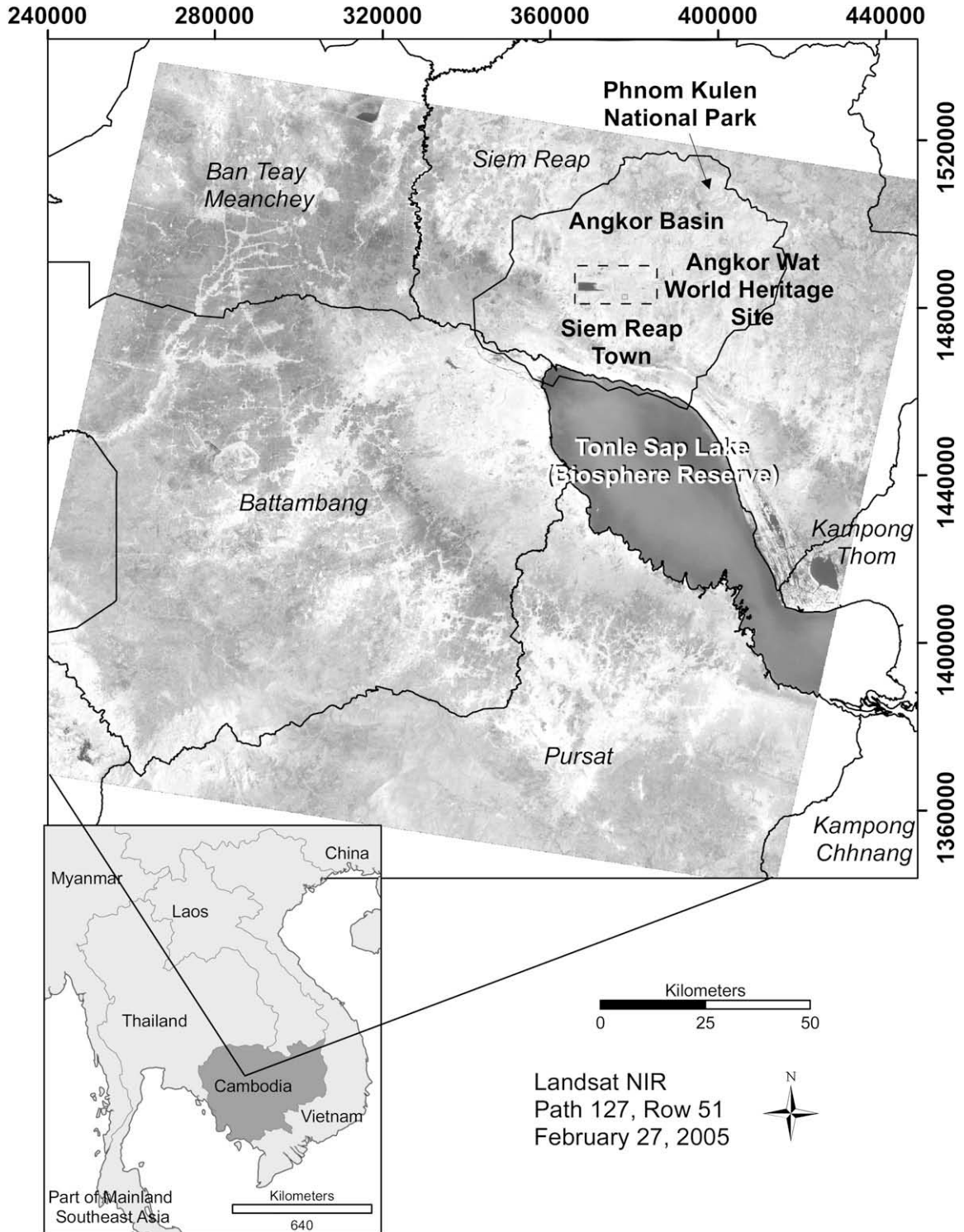


Fig. 1. Study region of the Angkor basin in Siem Reap, Cambodia, with 6 provinces that form the perimeter around Tonle Sap Lake. The Angkor basin is highlighted in yellow and protected areas of interest identified.

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