

Private property and Mennonites are major drivers of forest cover loss in central Yucatan Peninsula, Mexico



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ABSTRACT

The role of land tenure and Mennonites as drivers of deforestation in the Central Yucatan Peninsula has not been empirically assessed. We evaluate different drivers and their relationship to forest cover change between 1986 and 2015 and assess how land tenure and Mennonite communities impact forest cover loss in the Municipality of Hopelchen, Campeche, Mexico. This study shows that forest cover loss has increased in the last decade (2005–2015), and that land tenure regime type is associated with this loss. Throughout the study period, statistical comparisons show rates of forest cover loss were significantly higher in private and federal property compared to forests in *ejidos* (communal property). Forest cover loss in Mennonite private property was also significantly higher than in non-Mennonite owned private property. The role of land tenure and the expansion of the agroindustrial production model as major drivers of forest cover loss in the region provide important insight into developing municipal land use plans and conservation strategies to reduce deforestation. Programs, incentives and policy directed towards forest conservation in the region that typically target ejido communities, will need to consider the growing trend of private property expansion within federal lands and work more closely with private property owners including Mennonite communities if deforestation reduction programs are to be successful.

1. Introduction

Tropical deforestation amounts to approximately 11% of anthropogenic greenhouse gas emissions (Tyukavina et al., 2015), which represents a major challenge for global climate change mitigation. Since 2008, the United Nations Collaborative Programme¹ for Reducing Emissions from Deforestation and Forest Degradation (REDD+) has become an important mechanism to drive national land use policies in developing countries and promote conservation, sustainable forest management, enhancement of carbon stocks, and sustainable rural development (Angelsen et al., 2012; Danielsen et al., 2011; UN-REDD Programme, 2010). In this context, Mexico has emerged as an international leader, with the ambitious goal of reducing deforestation and net carbon emission rates to zero by 2020 (CONAFOR, 2014; CONAFOR, 2010). Although deforestation in México has decreased over the past two decades, more than 150,000 ha of forest cover are still

being cleared annually (FAO, 2015). The majority of this loss occurs within tropical forest landscapes, such as the Yucatán Peninsula (Céspedes-Flores and Moreno-Sánchez, 2010; Challenger and Soberón, 2008; Velázquez et al., 2002).

To develop effective strategies at local levels and sound policies at national and state levels that reduce deforestation, it is essential to identify and evaluate the proximate (direct) and underlying (indirect) causes (or drivers) of forest cover loss (Salvini et al., 2014; Kissinger et al., 2012; Geist and Lambin, 2002). In this regard, previous studies have investigated land tenure as an underlying cause of deforestation, particularly in tropical regions (Fearnside, 2001; Doherty and Heike, 2011; Sant'Anna and Young, 2014). For example, studies in Brazil, Ecuador and Haiti have found higher rates of deforestation where land tenure is less secure (Fearnside, 2001; Cattaneo, 2001; Messina et al., 2006; Dolisca et al., 2007; Sant'Anna and Young, 2014). Securing tenure rights and community ownership of forests have been proposed as

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¹ Part of the United Nations Framework Convention on Climate Change (UNFCCC).

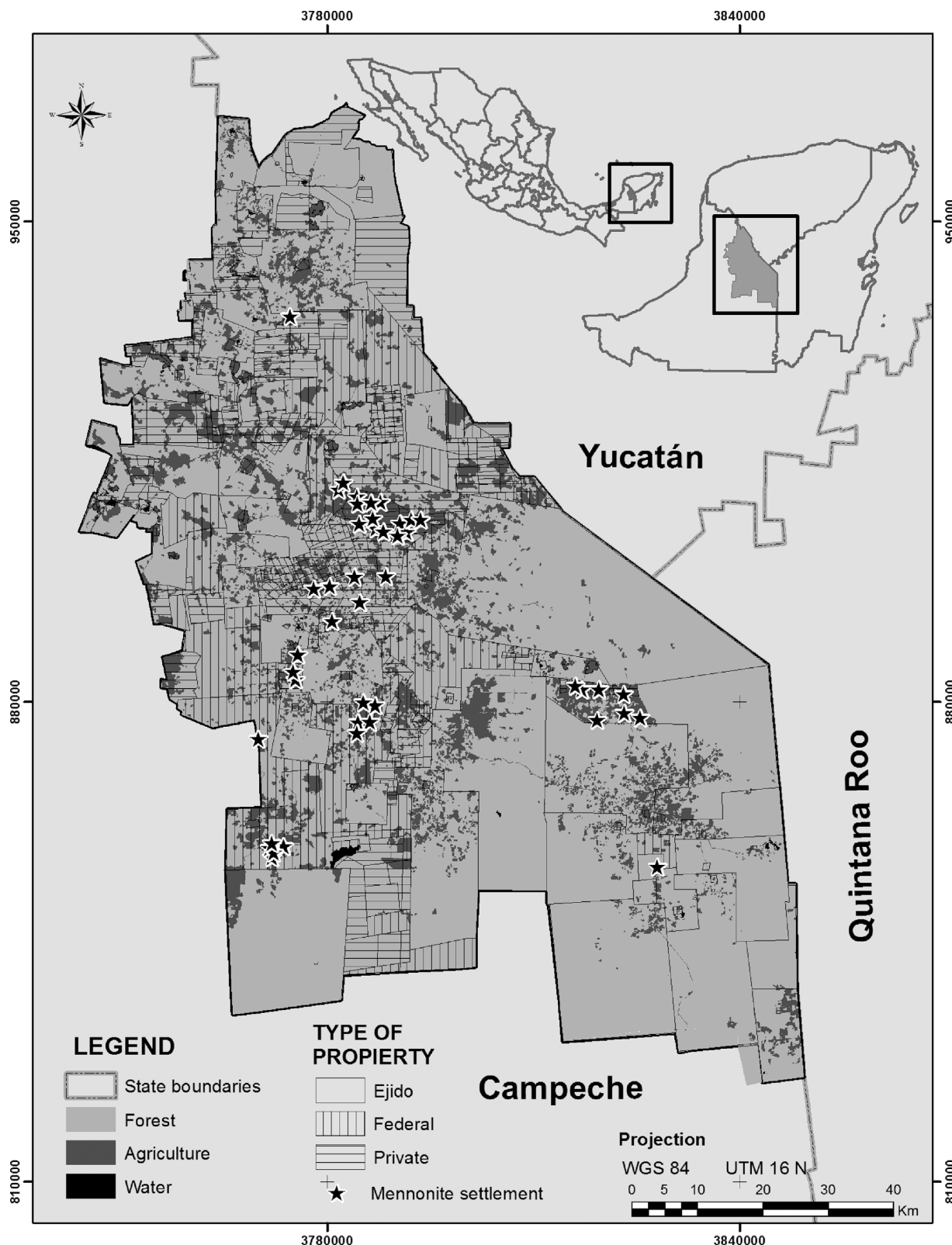


Fig. 1. Location of study area showing land tenure regimes, Mennonite settlements and land tenure regimes in the Municipality of Hopelchén, Campeche, Mexico.

mechanisms to reduce tropical deforestation (Kissinger et al., 2012), nonetheless research investigating the role of private versus communal ownership of forests in tropical regions worldwide is scarce.

Mexico’s government-sanctioned communal property system (including both *ejidos*, and *comunidades agrarias*), may be playing an important role in regulating land use change, since communal properties

currently occupy 60% of the country’s total forest cover (Madrid et al., 2009). However, reform of the Agrarian Law in 1992 allowed provisions for voluntary privatization of *ejidos* (Barnes, 2009). Although most rural *ejidos* have shown resilience towards privatization, there is evidence of structural changes within their institutional configuration (Barnes, 2009; DiGiano et al., 2013). This destabilization of social

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