

Tracing forest resource development in Ghana through forest transition pathways



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ABSTRACT

Tropical deforestation is a serious environmental and economic problem that has become a global issue due to climate change and biodiversity loss. Reducing tropical deforestation is seen as national and international priority, given its impacts on carbon emissions, biodiversity and rural livelihoods. Some developing countries have achieved a forest transition: a shift from net deforestation to net reforestation, whereby a few generic pathways have been identified. Such pathways usually depend on the social, economic, ecological and political contexts of a country. A better understanding of trends related to the pathways at the country level is necessary to identify which factors drive forest transition. This paper analyzes forest resources development trends in Ghana by focusing on forest transition pathways and discussing the implications for a forest transition in the country. The analysis indicates that there is currently no strong force toward a forest transition through any of the generic pathways. Existing trends are either too small-scale or too ineffective. To accelerate a forest transition in Ghana, policy and management options should target measures that reduce current degradation of closed natural forests, increase the area and productivity of commercial forest plantations, promote sustainable forest management, and support and encourage forest conservation and integration of trees into farming systems.

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1. Introduction

Tropical deforestation is a serious environmental and economic problem that has become an issue of global concern due to climate change and loss of biodiversity. Deforestation affects economic activity and threatens the livelihood and cultural integrity of forest-dependent people at the local level (Culas, 2007). With an annual deforestation rate of 0.5%, Africa has the second highest deforestation rate in the world (FAO, 2010a). A recent estimate of Ghana's deforestation rate is 135,395 ha annually, resulting in a dramatic decrease in the forest cover from approximately 7.5 million ha in 1990 to 4.9 million ha in 2010 (FAO, 2010b), and an annual loss of about US\$134 million gross revenue (Damnyag et al., 2011; FAO, 2010a).

The rapid loss in forest cover appears to have consequences for the climate system in Ghana. The country is already experiencing

an increase in extreme weather conditions, with more frequent incidences and longer periods of drought, flooding, and lowering of water levels, particularly in the Volta River, which provides about 80% of the national electricity supply (Cameron, 2011; MoFA, 2007; World Bank, 2010). Major concerns in Ghana arising from loss of forest cover and climate change include severe impacts on land use, biodiversity and soil fertility loss and land degradation (Bamfo, 2008; Cameron, 2011; Damnyag, 2012). Reducing tropical deforestation is thus a national and international priority, given its impacts on carbon emissions, biodiversity and livelihoods (Culas, 2007; Meyfroidt et al., 2010).

While deforestation continues to be a major concern globally, some tropical developing countries have experienced forest transitions: a shift from net deforestation to net reforestation (FAO, 2010c; Mather, 1992; Meyfroidt and Lambin, 2011; Rudel et al., 2005). Forest transitions result from multiple trends: natural forest regeneration, forest plantation establishment and adoption of agroforestry systems that are combined in various ways through time and space (Meyfroidt and Lambin, 2011). In the literature, a forest transition is at times presented as a quasi-deterministic process that implies that the long-term development of forest-cover

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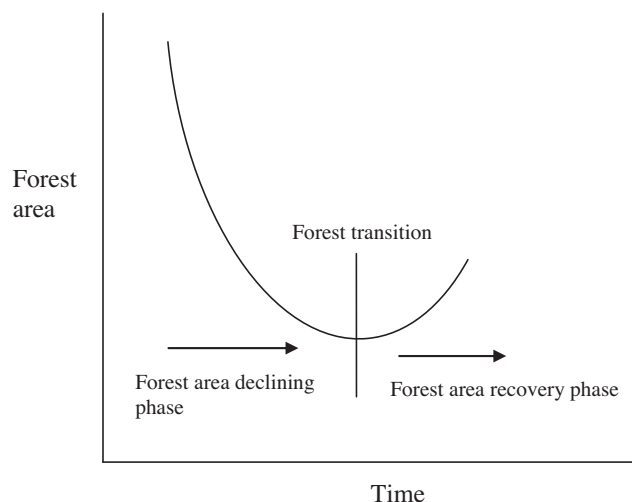


Fig. 1. Phases of the forest transition.

(Source adapted from: Barbier et al. (2010)).

change in a country is expected to follow a trajectory of decline and regrowth (Fig. 1), which can only be delayed or accelerated by policies (Barbier et al., 2010; Meyfroidt and Lambin, 2011). So far, considerable attention has been directed toward the analysis of forest transitions, documenting the restoration of degraded forests and the emergence of sustainable forest exploitation practices, while assessing forces that drive these transitions (McCay and Rudel, 2012).

1.1. Forest transition theory (FTT) and its pathways

Forest transition (FT), defined as a shift from a shrinking to an expanding forest area in a country or region, provides a framework for understanding scenarios in which a country or region shifts from a decreasing forest cover to an increasing forest cover over time (Farley, 2007, 2010; Mather, 1992; Mather and Needle, 1998; Meyfroidt and Lambin, 2011). Initially, deforestation is rapid and the forest area declines as a consequence of factors related to population growth, agricultural expansion and demand for timber and wood fuel. But once the country or region becomes more socio-economically developed, modernized and industrialized, forests become more valuable and political demand for forest conservation stimulates forest protection, regeneration, and plantation establishment. At the same time, the pressure for more agricultural lands may become less as a result of increased efficiency of agricultural productivity. Consequently, the forest area may enter the so-called recovery phase (Fig. 1).

The exact mechanisms that operate in forest transitions vary across locations (Perz, 2007). Five pathways of forest transition have been suggested (Lambin and Meyfroidt, 2010; Rudel et al., 2005): the economic development; forest scarcity; globalization; state forest policy; and smallholder, tree-based land use intensification pathways. In the economic development pathway, it is hypothesized that economic development creates enough non-farm jobs to cause farmers to abandon their land, thereby inducing forest regeneration, and conversion of marginal lands into forests. Industrialization and the growth of the service economy drive labor force from agriculture in rural areas to other economic sectors in urban areas. Agricultural intensification and productivity increase food production on most suitable areas resulting in depopulation and agricultural decline in the least suitable areas. Thus, labor scarcity rather than forest products scarcity drives conversion to forests (Klooster, 2003; Kull et al., 2007; Meyfroidt and Lambin, 2011; Rudel et al., 2005). The economic development pathway has

been commonly observed in developed countries, but some examples are also found among developing countries, such as Vietnam and Mexico (Farley, 2007; Lambin and Meyfroidt, 2010; Meyfroidt and Lambin, 2011; Turner II, 2010).

In the forest scarcity pathway, an increase in forest area occurs in response to the adverse impacts of deforestation and/or a decline in the flow of services provided to society by forest ecosystem. The scarcity of forest products increases their value and prompts governments and land owners to plant trees or establish afforestation programmes. Governments are also induced to implement policies to restrict forest exploitation, create protected areas, promote more sustainable management practices and fuel wood substitution, and invest in forestry research and reforestation programmes (Lambin and Meyfroidt, 2010; Meyfroidt and Lambin, 2011; Rudel et al., 2005).

Rudel (2002) conceptualized globalization as the internationalization of markets. Thus, the globalization pathway occurs as national economies become increasingly integrated into and influenced by international markets and ideologies. The globalization pathway can manifest itself in a variety of ways: through the export of forest products from rural areas or through the implementation of international environmental agreements related to forestry practices. Globalization could also be manifested through rural poor seeking employment outside their region or country and sending back remittances to marginal rural areas, which can relieve pressure from the land. International environmental non-governmental organizations (NGOs) may also globalize forest management practices (Farley, 2010; Hect et al., 2006; Lambin and Meyfroidt, 2010).

In the state forest policy pathway, also referred to as “government-led path” by Bae et al. (2012), national forest policies, motivated by factors outside and within the forestry sector, play a central role in promoting forest transition. While the policies may be in part triggered by elements of the forest scarcity pathway, the state forest policy pathway differs by its underlying motivations, which are often factors outside the forestry sector, such as willingness to modernize the economy, integrate marginal social groups, promote tourism or foreign investment by greening the image of the country, assert control over lands through creation of natural reserves or managed state forests (Lambin and Meyfroidt, 2010).

Increase in forest cover through the smallholder, tree-based land use intensification pathway is associated with the expansion of woodlots and agroforestry systems and secondary succession on abandoned fallows that are sometimes enriched with timber species, usually at the forest margins. This pathway is not associated with a decline in rural population or in agriculture. The motivation of smallholders may be to decrease their vulnerability to economic and ecological shocks and guarantee their livelihood through ecological and economic diversification. This pathway is considered to be more likely to include indigenous species (although different in composition and structure than primary forests), to have conservation value, to make substantive contributions to the provision of ecosystem services, and is associated with fragmented landscapes (Lambin and Meyfroidt, 2010).

Given that the country context can strongly influence which factors are most important in driving forest transitions (Farley, 2010; Klooster, 2003), a better understanding of trends relating to the pathways at the country level is needed. The pathway that ultimately drives forest transition (Table 1) has important implications for the design and implementation of policies that aim at halting deforestation and ensuring forest recovery. In Ghana, trends suggest processes of rehabilitation and restoration of degraded lands, which seem consistent with certain forest transition pathways. Therefore, this paper analyses these trends and discusses the implications for development of forest resources in the country. The insights gained can be valuable for informed policy decision-making. The paper should also provide inputs to support ongoing

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