

Landscape Transformations in Honduras:

Exploring the Country's New Forest and Land Cover Map and its Policy Implications for REDD+ and FLEGT-VPA

Honduras' new Forest and Land Cover Map reveals emerging land use patterns. This Information Brief explores three of these patterns and discusses their underlying drivers, focusing in particular on the role of migration and remittances in shaping land use in landscapes dominated by small farmers. The final sections of the article describe the existing or potential implications of these dynamics for Honduras' ongoing REDD+ and FLEGT-VPA processes.

Introduction

In September 2014, the Government of Honduras released a new high-resolution Forest and Land Cover Map. The new map provides critical information for natural resource policy. It includes more forest vegetation types than previous forest maps, and for the first time it also portrays the extent and distribution of human land use.

The purpose of this Information Brief is to discuss three land-use categories identified in the new map: (i) successional secondary vegetation, (ii) coffee agroforestry areas, and (iii) trees outside forests. While these categories represent widely different forms of land management, they have in common the fact that they are woody vegetation formations that are often "invisible" and hence have been overlooked in forest policy to date.

The map's information on these young forests and tree formations is important because their expansion denotes broader transformations underway in the country's rural areas – transformations that are shaping landscapes and having far-reaching implications for development and conservation. This article explores key underlying drivers behind these landscape changes, and then discusses the potential implications for REDD+ and the forthcoming FLEGT-VPA (Box 1).

The New Forest and Land Cover Map

Honduras' first high-resolution Forest and Land Cover Map was developed using RapidEye satellite imagery, primarily gathered in 2013. The map provides spatially explicit information on eight forest types and fifteen other land use categories (see Figure 1). In line with previous estimates, it reveals that Honduras' total forest area is 5.4 million hectares (Mha), corresponding to 48 percent of the country's total land mass. Pastures and agricultural fields are aggregated into one category and comprise the second largest land cover class (28 percent of the total area).

With respect to earlier forest maps, a major contribution of the new map is the quantification of various categories of other wooded vegetation, which however are not included in the map's definition of "forests" and hence not included in the forest area data. These "new" categories are briefly discussed in the following paragraphs.

Box 1: REDD+ and FLEGT in Honduras

Over the past decade or so, a number of international policy initiatives have emerged in response to concerns about forest conversion and degradation. Chief among them are Reducing Emissions from Deforestation and Forest Degradation (REDD+, in which the “plus” refers to an expanded concept that includes conservation and enhancement of forest carbon stocks as well as sustainable management of forests) and the European Union Action Plan for Forest Law Enforcement, Governance and Trade (EU FLEGT).

REDD+ is an international mechanism framed by multilateral climate change negotiations. Its aim is to provide performance-based incentives to developing countries for carbon sequestration and to support associated land use planning and institutional reform. Honduras started formal REDD+ preparation activities in 2008, with the support of the Forest Carbon Partnership Facility (FCPF) of the World Bank. The final version of the Readiness Preparation Proposal (R-PP) was submitted in July 2013. Since July 2014 the Secretary of Energy, Natural Resources, Environment and Mines (SERNA) has been undertaking an FCPF-funded Readiness project to start the implementation of the R-PP.

The FLEGT Action Plan sets out the European Union’s (EU) commitment to promote a more sustainable global timber trade. Voluntary Partnership Agreements (VPAs) are among the primary mechanisms of the FLEGT Action Plan. A VPA is a bilateral trade agreement between a forest product producing country such as Honduras and the EU. Its purpose is to support improved governance in the forest sector of the producer country and provide a mechanism to assure the legality of the timber products exported to the EU. Official VPA negotiations between Honduras and the EU started in 2013, and are scheduled to last at least until the end of 2015.

Source: Broekhoven et al. 2014.

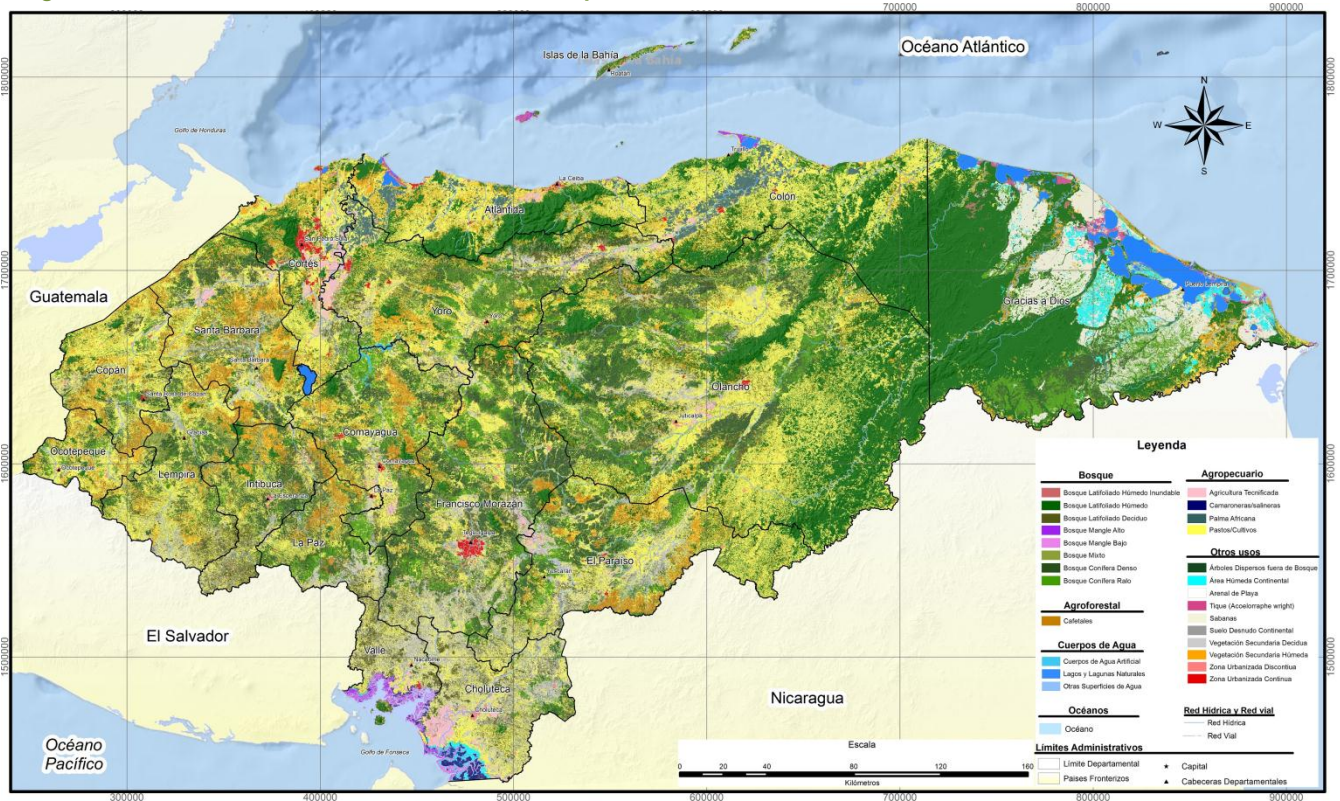
Expansion of secondary vegetation: The new map estimates that Honduras has 1.3 Mha of secondary woody vegetation, distributed all over the country but particularly abundant in areas of the south and west. This is a rather surprising finding. For decades there has been widespread concern about the shortening or disappearing of fallow periods in traditional shifting agriculture, which could lead to soil depletion and irreversible degradation (Buckles et al. 1994). In sharp contrast, the new evidence indicates that a large portion of the country (over 10 percent) is covered by successional secondary vegetation.

More coffee agroforestry areas: The new map also reveals the expansion of coffee growing areas, which cover more than 240,000 hectares (ha), mostly in central and western areas of the country. This represents a 60 percent increase from the 150,000 ha estimated 20 years ago by the 1993 Agricultural Census. The majority of this growth is due to the uptake of coffee growing by small farmers cultivating less than 5 ha – these represent over 90 percent of the country’s 130,000 coffee producers. While the map does not distinguish between shade-grown and full-sun coffee areas, it labels all of them as agroforestry systems, reflecting the fact that 95 percent of small-scale coffee plantations are cultivated under shade trees in order to maintain favorable growing conditions and diversify production (Ordoñez 2013).

A lot of trees outside forests: The map also records 160,000 ha of tree formations outside forests, distributed fairly evenly throughout rural areas. While significant, this finding gives only a partial appraisal of tree resources outside forests because it does not include trees in agroforestry systems, pasture lands, and crop fields, in which according to the 2006 Forest National Assessment there are more than 25 million cubic meters of wood (AFE-COHDEFOR 2006).

These results from the new Forest and Land Cover Map are in line with findings from a growing body of literature on land use dynamics in Honduras. A recent study by Redo et al. (2012) found that while Honduras is still experiencing deforestation in frontier areas of the northeast, there have been significant processes of forest recovery in the pine forest and dry forest areas of central, southern, and western Honduras. Similar evidence has been documented by others elsewhere in southern and western Honduras (Munroe et al. 2004, Bass 2006, Redo et al. 2009).

Figure 1. Honduras' New Forest and Land Cover Map



Source: ICF 2014a.

Furthermore, a recent deforestation analysis (MGM Innova 2013) found that even in parts of the country experiencing rapid net deforestation, such as the eastern and northern departments,¹ there has also been significant forest regrowth. Forest loss (80,000 ha yr⁻¹) in the area studied (almost 60 percent of the country) was partially offset by a regain of forest cover over 31,000 ha per year between 2000 and 2010, mostly in the broadleaved forest biome. This estimate concerns forests that have already recovered a significant portion of their original biomass, indicating secondary successions that have been ongoing for at least 10-20 years.

Sources (see above) also highlight that a large proportion of forest recovery is happening in landscapes dominated by small hillslope farmers (usually known or self-identified as “campesinos”), and attribute it to land use decisions by these small producers – decisions to either abandon agricultural activities or expand shade-coffee growing. In sum, while the national “picture” is one of ongoing deforestation, fragmented agrarian landscapes are often substantially wooded and becoming more so, especially on smallholder farms (Hecht et al. 2012).

These landscape transformations are influenced by local circumstances (household assets, natural resources endowments, tenure structures, etc.), but the role of external factors has become stronger over time. At the risk of oversimplifying, the following sections focus on key forces linked to the processes of globalization that can be linked to the transformation of rural livelihoods and contributed to the expansion of these woody vegetation formations over the past decades.

Smallholders in Rural Honduras

Smallholder *campesino* families comprise about 80 percent of Honduras’ rural population – in total around 700,000 households (more than a quarter of which are headed by women) living in rural hillside areas (World Bank 2011, INE 2011, INE 2013).² They are among the nation’s poorest people (Box 2).

¹ As in many other countries, departments (eighteen in total) represent the higher administrative and political subdivision of Honduras’ territory.

² Hillside areas include areas with slopes of more than 12 percent and the associated valleys; they account for roughly 80 percent of Honduras’ total land area (Jansen et al. 2006).

Box 2: Poverty in Rural Honduras

Poverty is a predominantly rural phenomenon in Honduras. According to official data (INE 2013), over two-thirds (69 percent) of rural households live below the national poverty line and 56 percent live in extreme poverty. Poverty is particularly widespread and severe on rural hillsides, where in many areas more than 90 percent of the inhabitants struggle to survive on less than US\$1/day per capita (Jansen et al. 2006). This same source also reports that female-headed households on average have about 30% less income than male-headed ones, at least in part due to the many competing demands for female labor.

Approximately 70 percent of *campesino* families own small parcels of land, with an average size of less than 5 ha and often smaller than 1 ha (CEPAL, FAO and IICA, 2014). As many as 200,000 rural households have no land at all or very limited access to it (FIAN and Via Campesina 2000, Jansen et al. 2006).

Since the 1980s, Honduras has undertaken sweeping reforms to increase its market orientation, competitiveness, and global integration. These efforts were especially dramatic in the agricultural sector and have profoundly undermined rural livelihoods. Due to its broad impact on small farmers, perhaps the most noticeable element of these reforms was the liberalization of food imports. Honduras used to be known as the "grain basket" of Central America. It grew enough basic staple crops of maize, beans, and rice to feed its own people and export the surplus to the region. In the early 1990s, the Honduran government was persuaded by the World Bank and the International Monetary Fund to lower import duties on agricultural commodities, thereby opening the way for the import of cheaper maize, beans, and rice from global markets (Cáceres 2014).

Although small farmers may have benefited to some extent as consumers, they were drastically affected as producers. As imports increased, the price of grains fell. In 2008, maize producers received 29 percent of the 1991 real value, beans producers 26 percent, and rice producers a mere 21 percent (FAOSTAT 2014). This collapse in the real value of their products is a key factor behind the current severe poverty levels in rural Honduras.

Small farmers have responded by reducing staple grain production and diversifying their livelihood activities and sources of income beyond agriculture. An array of activities – including agriculture, casual wage work, forestry, petty trade, and informal production of goods and services – currently characterizes rural livelihoods. In addition, income diversification increasingly involves migration for many households, and navigating national or international labor markets.

Migration and Remittances

There are substantive differences between national and international migration. National migration is in general far less costly and risky. It permits greater circular migration and access to home resources; facilitates the flow of goods, information, and money with the community of origin; and at times is associated with multi-sited households engaged in both rural and urban livelihoods. It also tends to be relatively evenly gendered, with only a slight difference in favor of women (INE 2006).

In contrast, international migration is highly skewed in favor of young males. INE (2006) found that over 70 percent of international migrants from the country's rural areas were men, with three-quarters under age 35. The demographic profile of communities changes greatly with this type of out-migration, shifting from the "normal" pyramid shape into an "hourglass" pattern indicating the prevalence of older members and young children (Hecht et al. 2012).

The size of cash transfers to family members that stay behind is another key difference between national and international migration. In 2013, international remittances from Hondurans working abroad reached a record US\$3.2 billion (BCH 2014). From a macroeconomic standpoint, remittances have become crucial to the financial survival of Honduras and account for 17 percent of the gross domestic product. As a source of currency, they double the combined total of development aid and foreign direct investment (World Bank 2014). Average monthly

remittances fluctuate between US\$100 and US\$300 per family, and about one-fifth of all rural households receive them (BCH 2014, INE 2006).

Making the Links between Migration and the Map

As pointed out by Tiwari and Bhattarai (2011), the first outcome of an increased outflow of working age people from a rural community is a decline in household labor available for farming. The subsequent inflow of remittances boosts local incomes, which generally stimulates a demand for services, thereby creating employment opportunities in the service sector and drawing even more labor out of agriculture. The labor outflow may raise the wages of remaining workers and encourage landowners to save labor by leaving more fields to lie fallow (Rudel et al. 2005). Remittances also enable rural households to purchase food and reduce their need to grow and sell crops (Hecht et al. 2012). In addition, the gradual deepening of roots abroad can lead to the abandonment of farming investment on land owned back home (RDS 2008).

As a result, migration and remittances are contributing to agricultural retraction in many rural areas, and hence the expansion of secondary vegetation shown in the new Forest and Land Cover Map. Similar forest recovery processes linked to out-migration have been documented in many Latin American regions (see for example Hecht et al. 2006, Hecht et al. 2012 and Redo et al. 2012). Box 3 describes the effect of migration and remittances on a land use dynamic not examined in this article – the increase in pasture areas – that nonetheless is also contributing to the expansion of young secondary forests.

Box 3: Successional Vegetation on Idle Pastures

Studies in the department of Olancho found that remittances are also associated with the expansion of pastures (Reyes and Villa 2008, Reyes et al. 2012). Extensive cattle ranching is attractive in the context of labor scarcity because it secures land occupation while requiring limited labor input. But pastures are also related to the spreading of successional vegetation. Recent deforestation analysis (MGM Innova 2013) shows that 37 percent of the area deforested between 2000 and 2010 was covered by young secondary vegetation at the end of the analysis period (2010) – a trend associated at least in part with pastures left idle that regenerate into secondary forests. In neighboring El Salvador, a similar dynamic of pasture “abandonment” has been linked to high rates of cattle rustling that imply that grazing cannot be carried out without close supervision, which can become difficult in a situation of out-migration and labor shortage (Hecht et al. 2006).

Research carried out in Honduras also shows that remittances are often invested in coffee planting (RDS 2008, Reyes et al. 2012), which helps to explain the expansion of coffee areas identified in the new map. Growing coffee is labor intensive, but remittances allow for the hiring of local workers or the recruitment of manpower from nearby areas when labor demand is high, such as during the harvesting season. The use of remittances to plant coffee is also linked to a particular feature of the country’s coffee sector legislation, which establishes that *all* land under coffee cultivation is eligible for private land titling. In the case of protected areas, the only way to obtain a land title is to grow coffee (Reyes et al. 2012). Coffee cultivation is therefore used to secure tenure – a powerful incentive for investing remittances.

The link between migration and trees outside forests is less clear. However, evidence from southern Honduras suggests that older farmers whose sons no longer live with them tend to have a preference for tree resources because growing and selling timber products is less labor intensive than agriculture (Barrance et al. 2003).

Policy Implications for REDD+

In Honduras’ R-PP, as in most national REDD+ programs, there is a considerable emphasis on enhancing forest carbon stocks. Over 1.3 Mha of young secondary vegetation, as measured by the new Forest and Land Cover Map, offer significant opportunities to do this. According to Houghton et al. (2000), abandoned agricultural land that reverts to secondary forest sequesters from 1.5 to 5.5 tons of carbon per ha per year. The higher end of this range is associated with several factors, including the faster biomass growth experienced in younger forests. Even at the

lower end of this range ($1.5 \text{ tons ha}^{-1} \text{ yr}^{-1}$), it can be conservatively estimated that 1.3 Mha of secondary vegetation absorb 2 million tons of carbon per year – representing 75 percent of the country’s annual CO_2 emissions stemming from the burning of fossil fuels and the production of cement (World Bank 2014). Similarly, high biomass shade-coffee plantations have a net positive effect on carbon storage (assuming they did not replace natural forests).

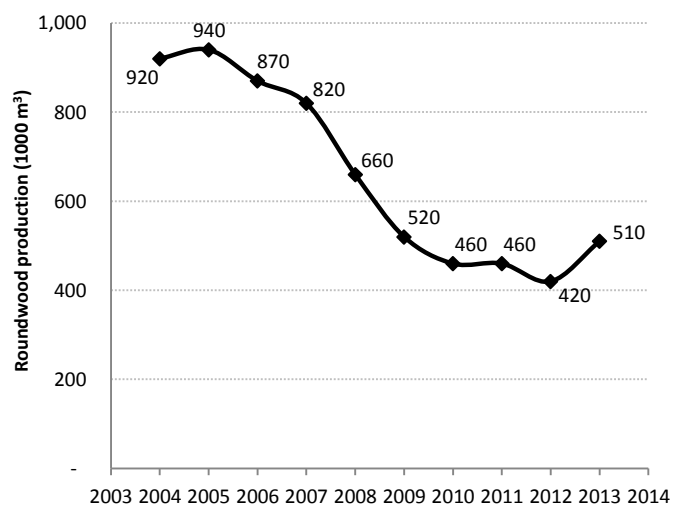
Promoting secondary regrowth in idle pastures or agricultural areas and supporting shade-coffee agroforestry systems could therefore be important components of the REDD+ program. For example, Ghana’s R-PP has a strong focus on reviving “REDD+-friendly” shade-grown cocoa cultivation. This would represent a significant shift for two sectors – ranching and agriculture – that have predominantly relied upon an expansionist production strategy and significantly contributed to forest loss and degradation over the past sixty years. For instance, REDD+ options in the case of pastures could include measures and practices that promote the establishment of tree formations for fodder and shade. In areas with better forest governance, interventions that allow for grazing efficiency gains could enable a reduction in the amount of land used for pasture. REDD+ actions in the coffee sector could focus on increasing the productivity and market opportunities for shade-grown coffee. Likewise, measures that facilitate access to timber income (e.g., less paperwork or marketing support) could increase farmers’ preference for growing coffee in association with commercial timber species. In addition, the evidence discussed in this paper shows that even small supplements to rural income can have significant impacts on land use and natural resource management, suggesting that REDD+ compensation schemes could have a significant impact on small farmers.³

... and for FLEGT-VPA

The discussion of potential implications for the FLEGT-VPA process needs to take into account a further dynamic. The retraction of smallholder agriculture and expansion of secondary vegetation have happened in parallel with another trend – a gradual decline in timber production. Honduras went through a logging boom in the 1970s and 1980s, but timber output has fallen over the last 25 years, and the decline has become steeper since the mid-2000s (Figure 3). A similar trend has brought about a profound restructuring of the timber industry in other regions of tropical Latin America. The process is that once forests are depleted of high quality timber, the larger export-oriented operators close down or move to other regions; this opens the way for the emergence of local operators, often family-run businesses that sell their products in nearby markets and source their raw material from the fields and secondary forests of local smallholders, allowing their insertion into a post-boom timber sector (Hecht 2008).

Honduras may be undergoing a similar transition. For decades the departments of Olancho and Yoro have been the main timber producing regions, but over the last ten years the number of sawmills has fallen by 60 percent in Olancho and 40 percent in Yoro (AFE-COHDEFOR 2005, ICF 2014b). In contrast, small-scale chainsaw milling activities in agroforestry systems and wooded pastures are supplying an increasing amount of timber products to local and national markets. This trend has been well documented in western Honduras (Chavarria 2010, Apaza 2011) and at varying scales it is occurring in many areas of the country (Photo 1). It is also likely to expand further given that timber stocks in agricultural mosaics exceed 25 million cubic meters (AFE-COHDEFOR 2006).⁴

Figure 3. National Roundwood Production (1000 m³)



Source: ICF 2014b.

³ Even though REDD+ payments will not necessarily have the same effect of out-migration and remittances.

⁴ Only a limited portion can however be considered harvestable for timber.

Photo 1. Small-Scale Harvesting Operation in Southern Honduras



Photo: Mario Ardón.

These dynamics raise some important issues for the FLEGT-VPA process. There is a pressing need to better understand these “less visible” forms of timber extraction, in particular seasonal logging activities or occasional uses by *campesino* farmers. Research efforts should explore timber sources, volumes extracted, transport flows, market dynamics, and economic impacts. But they also need to pay particular attention to local customary norms and practices that shape these activities, understanding their modalities, efficacy, and sustainability.

This is important because in the second round of VPA negotiations, carried out in October 2013, the Government of Honduras stated its intention to include all markets (domestic and international) in the agreement. Including the domestic market in the agreement could result in efforts to formalize the flows of timber that supply it – flows which often are not harvested and traded in accordance with current national forestry norms. This is the case for most of the timber harvested by smallholders, given that the 2007 Forestry Law and its implementing regulations do not provide tailored norms and procedures for micro- or small-scale commercial logging activities by individual *campesino* farmers.

In order to prevent the eventual exclusion of rural smallholders from the “officially legal” timber sector, formalization efforts will require legal reforms that incorporate existing norms and practices into codified legal frameworks. This will demand special attention to the “less visible” uses noted above. If existing uses and practices are not well understood, it will be difficult to develop new legal norms appropriate for micro- and small-scale logging activities.

Conclusion

This paper has explored emerging land use patterns in rural Honduras, focusing in particular on the contribution of migration and remittances to forest recovery processes in landscapes dominated by small farmers. The message of the paper can be summed up in two main points. Firstly, smallholder *campesino* families play an increasingly important role in woodland recovery and are located in areas where forest resources have the potential for further expansion. REDD+ and FLEGT-VPA should understand them as allies and ensure their effective participation in both processes, discarding outdated views that consider small farmers as drivers of deforestation.

Secondly, most *campesino* families remain extremely poor (as described in Box 2). As a matter of social justice and human rights, they merit more attention and policy support, including from REDD+ and FLEGT-VPA. Bespoke approaches and strategies must be developed if these initiatives are to work in practice for smallholders.

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