**Detecting Deforestation and Forest Degradation in the Toledo District resulting from intensive anthropogenic activities**

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ABSTRACT

Even though many studies have assessed deforestation and forest cover in Belize very few have estimated forest degradation. Reasons being that, forest degradation is less straightforward to assess from satellite imagery, and rates of forest degradation and fragmentation are difficult to obtain. It is widely recognized that in Belize forest degradation contributes to habitat and forest fragmentation, soil erosion, loss of biodiversity and aquifer depletion. Deforestation, along with equally important forest degradation, in developing countries are a leading cause of climate change, arguably the most serious global environmental problem; they account for a fifth to a quarter of total anthropogenic emissions of greenhouse gasses. Forest cover and deforestation data indicate that Belize’s deforestation rate between 1980 and 2010 was approximately 25,000 acres / year (0.6%). Years 2012 and 2013 data however indicates a dramatic reversal in this trend with percentage change in forest cover increasing to 0.81% in 2012 and 0.97% as of mid-2013.

According to the results of the 2012 study conducted by Cherrington Toledo is the district with the second lowest deforestation rate in the country; however in 2010 to 2012 the Toledo’s forested lands where under increasing forest degradation activities. This study utilized Landsat ETM+ imagery from 2010, 2011 and 2012 and new automated remote sensing technique, CLASlite algorithms, to map and analyze not only deforestation as a result of the increases anthropogenic activities in the area but most importantly forest degradation. Also surveys were conducted to collect data on deforestation and forest degradation drivers. The spatiotemporal analysis and the surveys provided the much needed data for planning, and executing sustainable forest management practices to address the current environmental problem.

**Keywords:** Landsat, deforestation, forest degradation, deforestation drivers.