smallholder farmers alliance

TECHNICAL RESEARCH NOTE: FOREST & TREE COVER IN HAITI

September 24, 2018

by Hugh Locke, Smallholder Farmers Alliance

Summary: Beginning in the late 1980s, Haiti became a poster child as "the most deforested country in the world." With photos of the border between Haiti and the Dominican Republic as evidence, people began to refer to Haiti as having "less than 2% tree cover," although the actual source of that statistic remains a mystery. While there is no question that deforestation is undermining the entire country and hindering its prospects for recovery, in reality Haiti has between 9 and 11% forest cover (a more accurate reference than "tree cover"). This still represents a serious problem because that forest cover is concentrated in a few areas and the remainder of the country is indeed severely deforested. But we all need to start using accurate data as we collectively strive to help improve conditions in Haiti.

That Haiti is severely deforested and needs more trees is an indisputable truth. Also beyond dispute is that 70% of the country's energy comes from wood and charcoal, which is a major ongoing cause of deforestation throughout the country. However, the statistic that is commonly used to describe this situation—namely that Haiti has less than 2% forest or tree cover—is not true. As is often the case with things in Haiti, the reality is considerably more complicated.

In the spirit of full disclosure, I am guilty of having used this 2% figure in the past and would now like to set the record straight. First by looking at how that number came to be so widely used, secondly by describing how it became debunked, and lastly by suggesting a more accurate way to present the situation.

Disaster Descriptive

In the late 1980s, as the Duvalier dictatorship entered its final destructive phase, Haiti acquired two descriptive phrases that entered the popular disaster lexicon in tandem. Haiti was referred to as "the poorest nation in the Western Hemisphere" as well as "the most deforested nation in the world." The former remains technically accurate, although failing to capture either the progress being made or the potential for improvement. While the latter is not entirely accurate, but nonetheless the statistic "with less than 2% tree cover" was inextricably linked and the combination deemed absolute fact.

When a "fact" is so widely disseminated by so many seemingly trustworthy sources, it begins to take on a life of its own. The odd thing is that no one seems to know the exact point of origin of the 2% number. But a "fact" with an accompanying image gives it even more credibility, and in this case there were three images that helped to make deforestation in Haiti the most publicized in the world.

Author Charles Cobb wrote a feature for the November 1987 issue of *National Geographic* magazine entitled “Haiti: Against All Odds.” It was accompanied by photographs by James Blair, one of which was used for a two-page illustration (see below).

Aerial photo of the Haiti – Dominican Republic border by James Blair (left) used to illustrate a November 1987 article (right) in *National Geographic* magazine.

The second image of the border (below) is a satellite image from NASA. It has been widely used to depict deforestation in Haiti, most notably in Al Gore’s landmark documentary *An Inconvenient Truth* (2006).

Haiti – Dominican Republic border. NASA/Goddard Space Flight Center Scientific Visualization Studio - 2002

The third and most recent image is not quite as well known as the first two, but this photo from the United Nations Environment Programme (UNEP) shows up on the cover of their 2013 publication *Haiti – Dominican Republic: Environmental Challenges in the Border Zone*. It should be noted that UNEP does not use the 2% tree cover statistic in this publication, but the photo itself shows up in many other places to illustrate this number.

UNEP photo of the Haiti – Dominican Republic border – 2013)

Debunked by Data and Definition

On one level it is easy to understand how the 2% number persists. Anyone who travels extensively in Haiti is familiar with the Haiti side of the three images above. Vast stretches of abandoned land that is devoid of anything but some sparse grass and the odd solitary tree or bush. But the same traveler encounters dense forest, although not a lot of it. I am not the only person to use bad math to justify the 2% number based on the overall land area vs tree cover.

Determining the truth starts off with good data.

One example of bad data is the UN Food and Agriculture Organization's (FAO) *Global Forest Resources Assessment 2015*[1] which reports that Haiti has only 97,000 hectares (ha) of forests, or just 3.5% of the total area of the country. The problem is that this report depends on the government of each country to provide the data used. The government of Haiti simply does not have accurate data, and so this assessment does not stand up to scrutiny. It also begs the question of why FAO would even bother to use data they know in advance is not going to be accurate, but that is another story.

The more reliable source of data is satellite imagery.

A 2013 study of land use change in the Greater Antilles estimated that woody vegetation and mixed-woody/plantation cover classes represent approximately 35% of Haiti's land area in 2001 and 40% of its area in 2010[2]. Two similar studies found the forested area in Haiti to be

[1] Food and Agriculture Organization (FAO), *Global Forest Resources Assessment*, 2015. http://www.fao.org/3/a-i4808e.pdf

[2] Alvarez-Berrios et al, *Land Change in the Greater Antilles between 2001 and 2010,* Land 2 81-107, 2013. https://www.mdpi.com/2073-445X/2/2/81

32.3% and 33.7% of the total land area[3]. Each of these three studies utilized GIS analysis of imagery and defined forest based on percentage of tree cover in relatively small pixels.

If you were only to go by satellite imagery, accurate as it is, you would conclude that Haiti is about a third forested. But you would be wrong.

While satellite data is unquestionably reliable, the problem with the studies cited above is the definition of the word "forest." There are literally hundreds of definitions that use different combinations of numbers of trees per land area, amount of land that the tree canopy covers in a given area, overall percentage of tree cover, and so on. The Great Antilles study that is referred to combined "woody vegetation" and "mixed-woody/plantation cover" as the basis of its definition. I would suggest that the better definition of "forest" is that used by USAID: "land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent." And this does not include land that is predominantly under agricultural or urban land use.

Once you apply a more stringent definition of what constitutes a forest, the USAID GeoCenter concludes that between 9 to 11% of Haiti's land is covered by forest.

When you start to break this country-wide number down, it is important to note that there are concentrated bands of forested areas that are largely responsible for the national percentage numbers.

Here it is important to note that "forest cover" is not the same as "tree cover." The trees that do not constitute a forest (that is, large continuous areas of closed canopy trees), do not provide the same vital functions of a forest in terms of slope stabilization, soil conservation, wildlife habitat, regulation of the hydrologic cycle and carbon sequestration. So in using the term "tree cover," this refers specifically to any area with some trees but no forests.

The reality is that large sections of the country are indeed severely deforested, although there is no data to suggest this subset of the entire landmass has less than 2% tree cover and so I would suggest that number be permanently retired.

In Pursuit of Accuracy

Here are forest/tree facts that are widely accepted:

- deforestation is a major factor in the breakdown of healthy ecosystems in Haiti, which in turn undermines efforts to develop the economy and improve food security;

- there is currently between 9 and 11% forest cover (as distinct from tree cover) for the country as a whole;

- large sections of the country have no standing forests and have very low tree cover;

- Haiti's forests are being degraded for several reasons, including high demand for wood-based fuels, high population density, extreme poverty in rural areas, and weak governance across the spectrum of institutions meant to define and enforce natural resources regulations;

[3] Churches et al, *Evaluation of forest cover estimates for Haiti using supervised classification of Landsat data,* International Journal of Applied Earth Observation and Geoinformation 30 203–216, 2014. Hansen et al, *High-Resolution Global Maps of 21st-Century Forest Cover Change*, Science 342 850-853, 2013.

- a 2007 World Bank study[4] concluded that over 70% of Haiti's energy comes from the approximately 4 million tons of wood harvested annually; and

- that same study reports that wood-based fuels account for 16.1% of average rural income, so that any attempt to move away from charcoal for fuel must include a way to improve smallholder farmer incomes.

[4] Energy Sector Management Assistance Program (ESMAP), *Haiti: Strategy to Alleviate the Pressure of Fuel Demand on National Woodfuel Resources*, World Bank 2007.