

Title: Digital images to estimate degraded pasture levels
Subtitle: Land use and land cover, degradation and desertification

Abstract:

Brazil has about 110 Mha of pasture land concentrated in the Cerrado and Amazon biomes, from which 70 Mha (63,3%) are in the process of degradation or are already degraded. The adoption of good management practices improving the quality of these pastures increases the productivity of livestock with consequent release of land for food and energy crop expansion. Major causes of pasture degradation in tropical and subtropical climate are related to inadequate management of both pasture land and grazing, which are responsible for: the loss of pasture vigor, the exposure of bare soil, and the appearance of invasive plants.

The assessment of pasture degradation levels using biophysical parameters and contextual information of the vegetation is not trivial, even at field level. Proximal sensing techniques might be a useful approach to assess the levels of pasture degradation. Therefore, a field campaign was carried out from September 26 to November 12, 2011, visiting 200 pasture samples in the Cerrado and Amazon biomes. For each visited sample the specie of pasture grass was identified along with measurements of biophysical parameters such as: plant height and dry biomass weight collected in three subsamples of 1 m². Also three digital camera images were captured at 2 m above ground level in vertical position. The RGB (red, green blue) images will now be transformed into intensity, hue, and saturation (IHS) components. Slicing and non supervised classification techniques should be applied on the HIS components to estimate the fractional cover of photosynthetic vegetation, non-photosynthetic vegetation and bare soil. For each digital camera images, random samples will be selected and visually interpreted to evaluate the results from the slicing and classification procedures. With the estimated fractional cover of photosynthetic vegetation, non-photosynthetic vegetation and bare soil the pasture degradation levels should be evaluated. It is expected that this methodology will be expedite and precise to contribute in the evaluation of pasture degradation levels in tropical and subtropical climate.