

Forest cover loss in Paraguay and Ecosystem Service approaches: an Upper Parana Forest study case.

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Tropical forest cover has fluctuated greatly over recent decades. The continuous advancement of agricultural crops, cattle ranching, and illegal logging has resulted in the conversion of the majority of the world's forest into isolated patches; endangering not only their continuity but the biodiversity within them. Despite that rates of deforestation have decreased in comparison to previous years, it still remains a crucial concern. The latest studies conducted on a global scale identified Paraguay as one of the countries in Latin America with the highest deforestation rates in the globe. The rapid growth of deforestation has resulted in the loss of 91% of the forest cover in the eastern region of the country (Alto Parana Atlantic Forest). In order to halt the predation of forest, several strategies, decisions, conventions, and monitoring programmes were carried out in an international context. One of the most promising alternatives is the Payment for Ecosystem Services (PES). The programme establishes a mechanism in which forests owners receive compensation to preserve their forest reserves and other natural environments. Within this context, the present research provides a characterization of the ecosystems service value derived from the Atlantic Forest Region in Paraguay (BAAPA). The results were obtained from the combination of Earth Observation-based mapping and an extensive household survey, to assess the value of direct and indirect ecosystems services provided by the BAAPA forest and their correlation to a socio-economic scale. Remotely sensed data obtained from Landsat images from 2003 and 2013 were utilized in order to derive the extent of the forest cover and deforestation rates over the past decade. Household surveys provided a comprehensive understanding of the perception of the ecosystems service influence on the preservation of the forest in regards to a mixture of landowners, such as: indigenous communities, small/large soy bean producers, and crop companies. Preliminary results demonstrate a lack of understanding regarding the value of natural resources, if no direct income is generated among the communities. Further differences between communities were observed when dealing with perceptions and general understanding of the importance of maintaining their forests. Indigenous communities are considered to be more concerned with protection of the forest for cultural purposes, whereas small and large soy bean producers expressed their willingness to obtain economical profits from the forest in a sustainable matter. Values obtained from the field surveys in combination with remote sensing data allow us to identify and characterize the value of ecosystems services in the BAAPA region. Recognizing and valuing ecosystem services is of great importance to the contribution towards planning measures aimed at preserving these very precious natural resources.

Keywords: Forest, BAAPA, deforestation, ecosystem services, field survey, earth observation, GIS