

ENVIRONMENTAL SUSTAINABILITY OF FORESTRY BIOMASS AS A SOURCE OF RENEWABLE ENERGY AS DETERMINED BY AN EVALUATION OF THE ECOLOGICAL INTEGRITY METHOD IN NATURAL RESERVES IN CENTRAL AMERICA: THE CASE OF HONDURAS.

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Abstract

Environmental sustainability of forestry biomass as a source of renewable has received much attention in recent years due to its important economic and social benefits. This research focuses on identifying the environmental sustainability potential of forestry biomass as a source of renewable energy as determined by an evaluation of the ecological integrity method in Honduras. The method employed includes the processing of images from RapidEye and Landsat TM satellite images and then comparing the forest cover loss within a range of 5 years (march 2014 to march 2019), considering the total area of the matrix of 5,542 hectares and then separating the vegetation cover from other land use classes such as agriculture and scrub to evaluate the Ecological Integrity of the ecosystem which seeks to capture the complex nature of ecosystems and their interaction with social welfare. As a result, it was found that the indicators Forest Cover (FC), Path Area (AREA), Fractal Dimension Index (FRAC) and Proximity Index (PROX) are outside the range of acceptable variation with a simple average of 1.75 far away from the goal of five (5.0); the forest cover loss was of 40% of the total area. This surprising finding suggests an immediate intervention for its maintenance, if not followed up the ecosystem will be exposed to severe degradation. Additionally, a Participatory Action Research approach was employed in order to generate data on some methods for sustainable and optimal use of forest biomass as a source of renewable energy in buffer zones of natural reserves in Honduras developing a proposal of characterization of biomass fuels focusing on five (5) native species to determine the energetic parameters in order to improve the Ecological Integrity of the ecosystem and the environmental sustainability involving local communities to restore the ecosystem.

Keywords: Environmental sustainability, Ecological Integrity, Renewable energy, Pine-oak ecosystem, Biomass.