

Mapping the Economic Value of Vegetation Carbon Sink and Stock in the Municipality of Cuenca (Spain)

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Executive Summary

Global warming due to human-made emission of greenhouse gases (GHGs) is nowadays a concern. The political and scientific consensus on this issue was formalized in the 1997 Kyoto Protocol by which over 170 countries seek to reduce their emissions or to develop mechanisms to sequester GHGs from the atmosphere. The most important of these GHGs is carbon dioxide (CO₂), being others like methane or nitrous oxide normally expressed in CO₂-equivalent. Participating countries and installations will have a cap in emissions allowed in terms of carbon credits and will be able to trade them. One of the mechanisms fostered by the Protocol to get carbon credits is by issuing carbon removal units from forestry, since healthy forests take in more carbon than they release and, after being sequestered, carbon is accumulated and stored in the living biomass and soil. Thus, estimating the amount of carbon sink and stock is crucial for starting such a credit mechanism.

The purpose of this project is to quantify and map the amount of carbon sequestration by above-ground biomass in the Municipality of Cuenca, one of the largest townships in Spain and the second in Europe with the most forestry cover. Specifically, the project will seek to answer a twofold question: **what is the evolution of vegetation carbon sink and stock in the Municipality of Cuenca over time and what are the most interesting areas in terms of economic value for carbon trading.** I will also seek to answer whether there is a relationship with terrain altitude, for the municipality ranges from about 870 m-above-sea-level to nearly 1,900 m, enough to see differentiated tree species at different heights.

Because of global warming and not considering in this project reforestation and afforestation plans, I expect the economic value of forests in Cuenca has declined over the years –and hence the extent of forestry cover, which in turn decreases the amount of carbon sequestration–, especially in the less-rugged lower altitude areas where the impact of urban areas is higher, cropland is perhaps increasing and the temperature is more moderate in winter.