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SYSTEMATIC LITERATURE REVIEW: COMPARISON BETWEEN DIFFERENT FOREST BIOMASS ESTIMATION METHODS

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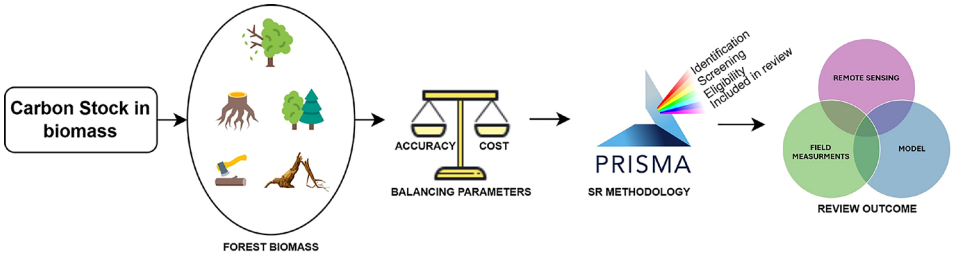
Abstract – Land use, land use change and forestry sector (LULUCF) is important in terms of carbon sequestration; it plays a crucial role in achieving Green Deal goal by making the EU climate neutral by 2050. This goal can be achieved by increasing carbon sequestration in LULUCF. Living biomass during its growth sequestrates CO2, therefore, if knowing the amount of biomass in forest, it is possible to calculate total carbon stock and annual carbon sink. Therefore, it is important to accurately estimate forest biomass. This systematic literature review (SR) follows PRISMA methodology (Preferred Reporting Items for Systematic reviews and Meta-Analyses method), which provides an overview of different methods used to estimate biomass from the forest. Several approaches to estimate biomass exist, like traditional methods, where measurements and information collections are done in field and allometric equations are applied; this method can be precise but needs large amount of labor and can be spatial limited, other method includes advanced technology, where remote and optical sensing data are used to determine variables, this method spatial efficient, but requires calibration with field data. Comparative analysis indicates advantages, limitations and accuracy of each method, showing the importance of compromise between scalability and accuracy. It is concluded that LiDAR can provide accurate information on higher cost, where SAR or ORS use can be cost effective but can be limited by complex data processing or cloud cover, field – based methods can have high biomass estimation accuracy, but can be time consuming. Future research should be aimed at hybrid methods, to achieve more precise biomass estimation, with lower costs.

Keywords – Allometric equations; carbon sequestration; GHG emissions; modelling; land use, land use change and forestry; remote sensing



Forest biomass estimation alternative methods

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