BOOK OF
ABSTRACTS

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Can planted and natural forests be distinguished in forest area development assessing different drivers?

T2.11 Forest-based sector in sustainability transformation: opportunities and sectoral impacts

Julia Tandetzki[1, 2]
Margret Köthke[1], Franziska Schier[1], Holger Weimar[1], Christian Morland[1]
[1] Johann Heinrich von Thünen-Institute of Forestry
[2] Georg-August-University Goettingen

Abstract: Global forest area dynamics can be represented as a function of drivers using the concepts of the Environmental Kuznets Curve for deforestation (EKCd) and the Forest Transition Hypothesis (FTH). Several studies have already analyzed the determinants of these concepts but a widely accepted consensus is still lacking. Based on a systematic literature review, we analyze the selection and significance level of socio-economic variables used in studies estimating EKCd and FTH. For this purpose, we extract independent variables used in 85 heterogenous estimation models. Across these studies, we identify 150 different drivers and assign them to 12 main categories according to their type (e.g., income factors or institutional factors). Our results reveal that the main drivers of forest area development are income, demographic, and trade factors. We also observe variations in the identified drivers when the choice of geographical scope and respective data selection, dependent variable, and the EKCd and FTH concepts are considered. We find that the latter influence the significance level of independent variables in relation to forest area development. We also find differences in the identified drivers across various continental studies, e.g., the forest area of Latin America is more strongly influenced by income variables when compared to forest areas in Asia or Africa. A closer analysis of the EKCd and FTH concepts, in our scrutinized studies, reveals unsolved challenges related to their application in developed countries. In particular, the afforestation component of the FTH has not yet been thoroughly explained. Thus, in a subsequent step, we develop the FTH concept further and split the curve shape of the FTH into two sigmoid functions. We then re-estimate the econometric model with significant economic drivers while differentiating the forest area types based on natural forests and planted forests and plantations. Our approach isolates individual drivers of forest area change and enhances the analysis and projection of forest area development thus contributing with a deeper understanding of global forest area dynamics.